

General Report
and Notes
on the
Natural History of
Washington Territory.
from the Great Plain
of the Columbia, westward
to the Ocean

by
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Northern Pacific R.R. Survey
1853 to 1855

* It will also be observed that the area of the country explored is greater than that of the State of New York and I may observe that while scientific exploration is continually bringing to light new facts in the latter, the Pacific Territories can be hardly considered to be yet half explored, though the principal external products have been long collected and examined —
v. A. p. 47½) New facts are thus becoming more and more scarce, and it requires a long time to accumulate much of interest in addition to what has been effected by the many able naturalists who have explored it —
v. A. p. 50) And as will appear evident it is infinitely less rich in animal life than the more southern parts of our western coast —

(To all the external natural features of a country are ^{materially connected with} its Natural History. I have deemed it important to give some description of its ^{contour} surface, ^{surface} ~~surface~~, scenery, and topography, in connection with its productions, and briefly to describe some of the ~~immense~~ ^{size} trees which form the gigantic forest near the coast. The plan I have adopted is then to give an abridgement of my journal, by which the ^{means of observation} ~~natural history~~ and local peculiarities may be best described, and afterwards a general Resume of ~~the natural features~~ ^{facts} so as to connect the detached observations and the present as far as possible the most striking outlines, of the ~~whole~~ western half of the Territory, —

As first impressions of a country are commonly the most striking, though they require the corrections ^{effected} ~~effected~~ by a long residence, I will make ~~occasional~~ ^{full} extracts from my journal where illustrations of particular localities, abridging it where less important.

And as the climate is so important in connection with the Natural History I ^{have made} ~~kept~~ notes on that subject, not so much the accuracy of meteorological observation but so as to show its general character and influence —

Prof. Baird

May 1st 1856

Sir -

Albany N.Y. 1856

Chapter I. Introductory - Arrival at Vancouver. Ascent of Cascade Mountains. Summits. Eastern Slopes. Valleys -

In a preliminary Report made by me to Capt. McClellan in Decr 1853 on the return of his exploring party from the east side of the Cascade Mountains, I attempted to give a general outline of the principal natural features of the country we had been traversing. The want of books for reference and the short time I had then spent in the country made that Report necessarily imperfect, and errors occur ~~both in~~ the naming of species referred to, and in the typography, which I was not present to correct. ^{more fully} I have therefore considered it best to repeat here the observations contained in it with such corrections and additions as I have been able to make since -

I am ~~also~~ under obligations to the Reports of ~~the~~ other members of the Expedition for facts in the Geology, Meteorology, and Topography of the Territory, ~~which from their intimate connection with its~~ Natural History, are of great importance in preparing an article upon that subject, and in arriving at those General results which are the most important and interesting objects of Scientific explorations.

The whole period of my residence in the Territory includes two years and three months, from June 13th 1853 to Oct. 7th 1855. Of this time only four months were spent in the exploration of the Cascade Mountains and the country east of them. ~~on the San Francisco~~ ~~Mounts.~~ The remainder of the time I ~~remained in or~~ resided on the coast ~~making several private~~ excursions ~~during that time~~ among the mountains of the Coast Range, and down the Northwest Sound as far as the Straits of Juan de Fuca.

My official connection with the survey having terminated ~~at the end of~~ ^{March 1st 1854} ~~after only a few~~ months, all my observations since then have been the results of these private explorations. The great difficulty and expense attending these in a new country, may I hope be sufficient

to excuse for their meagerness, ^{results} compared with what might be expected, had I been able to conduct them as I would have wished. ^{at least} They may ~~show~~ ^{show} how much must remain to be accomplished (under the expensive influence of California Gold.)

New York May 1st 1856

1a
Even the first and most indubitable.

These impressions of a country on the mind of the traveller are generally more correct and valuable than those derived from ~~the reports of those residing and proper observations~~ ^{preconceived opinions}

I may observe that I had been induced by descriptions to expect something very different from what I found to be the appearance of the Columbia River.

The same remark has been made to me by others and the inconsistencies of many authors with the reality is as remarkable as it is unaccountable.

The reason of this however seems to me to be that these accounts have been wanting in exactness so far that they have confounded the various portions of the territory without regard to the very marked natural differences between the Eastern and Western parts, much less between the different subregions so distinctly defined among our western Mountains and which have no parallel in the Atlantic States.

Besides this the accounts of the Voyagers, are very unreliable as they, travelling entirely along the rivers, observe little of the country beyond their immediate banks and are at best poor observers. I was surprised then on entering the mouth of the Columbia June 13th 1856 to find a country everywhere densely wooded, and a climate moist and ~~shower~~ ^{found} as warm as I had ~~left~~ ^{found} at Panama, instead of the bare hills, and dry season of San Francisco, which we last ^{just} left.

top. 2 1/2

Arriving at Fort Vancouver June 14th 1859 I was much disappointed at finding the best season for collecting specimens already passed, and that long day season commencing which on the western coast causes almost a complete cessation of vegetation as our winter. Besides, ~~there was~~ ^{in the} hurry of leaving I saw ~~that~~ ^{that} I had been obliged to leave behind me the trunks containing all my materials for making collections.

I was therefore able to do very little for a fortnight and when the ~~trunks~~ ^{trunks} arrived, my time was mostly occupied in preparing medicines etc. both for our party and Lieut. Saxton. I managed however to procure a few birds skins with Calomel, the ~~best~~ ^{best} antiseptic I could obtain, and collected a few fish and other objects.*

But as Vancouver has always been the principal field for the ^{many} collectors who have before visited the country I deeply regretted the opportunities lost. The Columbia River was then at the highest stage of its summer floods, which both prevented much travelling by land in its vicinity, and made it difficult to obtain many animals from it.

On the 18th of July the Expedition left Vancouver taking a course generally northeast so as to cross the mountains as soon as possible and reach the open country on their eastern sides. We very soon began to ascend the western spurs of the mountains and for two weeks were occupied in short and laborious journeys through an almost unbroken and impenetrable forest, ~~under~~ ^{and often} a boiling sun, making only from six to ten miles daily. A few extracts from my journal will perhaps best show the general character of our route and the scarcity of animal life.

Six days after we started, I with two others went ahead of the main train to follow Capt. Mc Clellan who had gone in advance with a party to clear a way.

"We started at 6 A.M. and for about ~~two~~ ^{two} miles the path led through ~~forests~~ ^{forests} with a moderate growth of underwood. Then came a prairie of about ~~two~~ ^{two} miles with ~~the~~ ^{where} the Capt. had encamped ~~this~~ ^{this} night before and had left a note for us. Crossing this we entered a forest

p. 2

* *Corvus Americanus* and *Colinus fasciatus* Say. *Carpodacus purpureus* Linn. *Eutamias amoenus* ^{B.V.} *Lanius*?

These references to the descriptions of specimens where fuller notes on them are given.

We had had a rather stormy passage up the coast, and had been obliged to lie off the mouth of the river all night on account of a dense fog. The wind blowing from seaward was cold, ~~and I have since found it to be almost~~ always in summer, and the prospect before us gloomy and unpleasant. It was therefore ^{an agreeable change} to find the air much milder within the river though the dense fog and drizzling rain which accompanied us on the way up the river were not the most agreeable introduction to a new country of ~~Ind.~~

The steep cliff and lofty mountains clothed with a dark and perpetual verdure, ^{with the numerous} and the many islands covered by the light green Poplars made the scenery pleasing and interesting even on such a dull day as that. Early the next morning we reached Vancouver, and the sun coming out bright and warm added to the favorable appearance of that beautiful site. The smooth green prairie gradually sloping into the river, picturesque dotted by the buildings of the Port and of the Hudson's Bay (or Fort) ^{was a beautiful scene to us though with our long voyage} The only unpleasant part of the new was the dead forest around one side of the place, which in spite of all care, will from the great combustibility of the "Fir" trees often take fire.

The magnificent Mount Hood placed as if for effect in full view from Vancouver, appeared indescribably grand as it ^{rose} ~~rose~~ ^{recepted by the rising heights of clouds} ~~rose~~ ^{the whole scene to us though with our long voyage} The whole scenery though scarcely as beautiful as in the tropics was more impressive than any I had ever seen at Portland.

Going ashore, I walked seven miles through the forest, delighted at every step with some new plant or bird, or with some familiar form no less interesting as finding this with any native land though ~~as~~ ^{to be} everything seemed ~~and~~ ^{of a superior growth} to its "Cotton ally" (1) — How I regretted that in the hurry of leaving San Francisco we had been obliged to leave behind us all our trunk with the ~~instruments~~ ^{for preserving specimens} (to p. 2)

(1) e.g. *Aquilegia canadensis* var. *formosa* (D. Fisher)
Asperum canaliculatum L. *Turnera borealis* Gronov.

(A) Following the narrow rugged ~~valley~~ of the bathypnothe
 Our journey for many days was rendered very unpleasant
 and by the roughness of the country, and the great heat
 added to which the air became so obscured by smoke
 from the burning forests around us that we could
 see nothing of the surrounding country. Some of our
 horses were killed by rolling down canon slopes, and
 for several days they could scarcely get enough to
 eat in the forests near the base of Mt. St. Helens. *

(I must confess that these difficulties and the ~~scarcity~~
 of animal life compared to what I had expected
 considerably damped my interest, and I nearly lost
 that feeling of industrious zeal which ought to inspire
 the naturalist in all circumstances.

* The thermometer frequently rose by day from 80° to
 99° - but the nights were always cool; a fact remark-
 ed by every traveller here, and which makes the heat
 much less oppressive, as it is always followed by a
 good nights rest.

B In this distance of 50 miles we passed through seven
 prairies from one to ~~five~~ miles in extent generally
 beautiful and with rich soil, producing abundant
 grass.

~~The dry, brown, and hot appearance of the former country
 was agreeably relieved by a rainy day, during which
 we encamped in a green meadow where grass 2 feet
 high, supplied our famished animals with food.
 Here we first raised our tents, which had not been
 needed before, there having been no rain for a month
 as the dry season had fairly commenced, however.~~

The woods around this meadow were however all
 dead, having been lately burnt over and ~~no new~~
 growth of any kind having yet begun. In these
 one of the first plants to spring up is the "Willow herb" (1)
 which during this time gave the hills frequently for
 miles a purple color from its bright flowers around
 which great numbers of Humming birds were feeding.

Nothing further of interest occurred until we reached
 the "Chequamegon" Prairie.

- Tetras obscurus 2
- ** Sorex Douglasii No 3
- Salix holosteleus Entomiae Nos 3, 4, 5, 6, 9
- Lacerta No 5
- * Salamander No 1 young?

(C) Epilobium angustifolium L.

28 1/2
 15 1/4
 42

~~A~~ I collected during this part of our journey very few animals. ** On the prairies I found three species of Garter snake and a small Lizard. A few small fish Trout, crane fish, and minnows were all I could obtain in the rivers. I found the nets provided for the purpose of no use in these mountain torrents, so obstructed by brush, logs, and deep holes that it is impossible to drag any net through them - With much difficulty and patience Capt. Mc Clellan succeeded in catching a few small trout with the artificial fly, ~~one of which~~ ^{one of which} I preserved. At other seasons they are said to bite readily.

~~B~~ Scarcely any plants were in flower and this side of the mountains having been before thoroughly explored by botanists I did not collect any until we reached the summit of the Banga ^{see p 4 1/2}

On the 3rd of August we ascended by a steep and almost unbroken acclivity to the highest part of the mountain reached by us, which is elevated about 4000 feet above Vancouver, and more than 1500 above the valley of the Cathlamet River which we had been following up. Here we found a considerable change in the appearance of the country and in its productions though less than might have been expected. The Fir and Spruces of the western slopes were replaced to some extent by a beautiful species of silver spruce ⁽¹⁾ and a small variety of the White Pine ⁽²⁾.

A dwarf Juniper spreading like a carpet on the top of the highest hill I ascended was the most characteristic of an Alpine flora that I observed.

~~p. 5~~ I supposed from a distant view of the snow peaks from this point which was over 5000 feet above the sea, that vegetation continued upon them 1000 feet higher. About our camp it was a little luxuriant and most of the plants I observed were the same as I had seen at Vancouver flowering a month before.

~~Berry strawberries which were found at Vancouver when I arrived there, were here in abundance, and a fine large and highly flavored species of Whortleberry was plentiful with two other kinds before seen.~~

(1) *Abies mobilis* Dougl. (2) *Pinus Strobus* L. var. ^{Dougl.} *monticola* 3 I have not been able to find any answering to the description of this in the Flora Bor. Amer. The berry is nearly as large as the European grape and has a very agreeable musky flavor.

* but of more stunted growth.

Aug. 5th Crossing the forks of the river we began to ascend a mountain consisting of ~~five~~ terraces each about fifty feet high surmounted by a steep hill rising about 2000 feet above the valley in an almost unbroken continuity. The summit was gently undulating and at half a mile from the edge we encamped in a beautifully green valley traversed by a brook of ice cold water.

Here the hills were covered with a species of Huckleberry, with fruit nearly as large and finely flavoured as a grape, while the ground was in many places carpeted with strawberry vines, the fruit now ripe.

Blue, purplish, yellow and white, flowers in the greatest profusion adorned the grounds, giving it the appearance of a natural garden, and altogether it was the pleasantest camp we had since leaving Vancouver.

Two kinds of Pine, and a Spruce with very beautiful foliage replaced to some extent the trees of the lower country. All were however young trees not more than twenty feet high, the dead trunks of the old growth still standing, as evidence of one of the conflagrations so common on these mountains.

5th Left camp early and travelled 9 1/4 miles to a small marshy meadow full of excellent grass two feet high. Most of the route was through a burnt forest with but little living vegetation, and no animals except Sorex, striped squirrels and Jays. Insect C. p. 3 1/2

7th It rained all day at intervals for the first time since leaving Vancouver. Remained encamped to allow the horses to recruit after their recent hard fare.

I went out among the burnt forest & surrounding as but got no animals except some grouse.

8th Travelled 6 miles to Chignous Prairie, an open valley partly covered with young spruce trees.

The hills around are all burnt over and have a gray appearance, from the multitude of dead trees.

The sky continues cloudy and in the afternoon a storm of hail came on with a high wind and great increase of cold. — V. A. ~~opposite~~ page 4

Most of the forest on this part of the mountain had been recently destroyed by fire and the young growth had yet hardly commenced. Some prairie and marshy meadows at the head of streams ^{like that} were covered with luxuriant grass and adorned by a great variety of brilliant flowers. In fact the ~~weather~~ ^{climate} at this height in August, corresponded to that at Vancouver, and though quite warm by day was so cold as to form ice ^{3 or 4 inches} at night. Spring ~~summer~~ and autumn ~~are~~ so crowded together as to constitute but one short warm season, which never becomes dry, as the summer in the lower country. We had several showers of rain and hail during the five days we spent on the summit. Animals of many kinds were abundant, but I saw none not before observed. The ground was undermined by the burrows of great numbers of striped squirrels, and the Pine squirrel was also common. Ducks, Geese, and Cranes were common, these high cool regions being probably their favorite breeding grounds, and I observed other ~~small but~~ interesting birds. The Blue Grouse was abundant and the Canada grouse has since been obtained by Dr. Suckley from this locality.

I saw however none of the larger animals peculiar to the snowy summits of the mountains, but was assured by the Indians that the Mountain Sheep was found about some of the peaks, which was afterwards confirmed by their skins being seen, fresh, among the Indians near Mount Rainier.

When on the morning of Aug. 9th the rain had extinguished the fires in the woods and cleared away the smoke which had enveloped us for several days, the view revealed was one of magnificence, probably unsurpassed in America. Fine lofty mountains surrounded us, covered with perpetual snow for many thousand feet above us, who were still far from its lowest limit. I much regretted that time did not permit an ascent of some of these peaks so inviting to the naturalist. Months might well be spent in exploring the natural history of this the most interesting part of our whole Route.

* Specimens preserved - *Sciurus douglasii* *Tamias cooperi*
Hesperomys? " *Woodpecker* No 12 & 12*
 † *Sialia arctica*? *Phalaropus*?

Our short stay on these mountain summits and the unfavorable nature of the country passed through prevented more than a mere glimpse of its peculiar natural products —

A. is therefore quite different from. Their appearance ~~contrasts strongly with~~ those west of the mountains, which we had found so difficult to penetrate on account of the dense thickets, while here the open ~~timber~~ ~~openness~~ ~~and~~, tall bare trunks, and general covering of good grass, gave them the aspect of a forest park.

One days notes will show sufficiently the appearance of the country —

B Aug. 16th Proceeded 8 1/4 miles through a similar forest crossing one or two small streams. Our guide mistaking the trail led us to the edge of a "Canon" at least 200 ft deep, from where we over looked a region of high mountains with almost perpendicular sides, the peak of Mount Rainier rising above them towards the northwest. This being quite impassible for our heavily packed animals we turned back and took a short cut across the forest in hopes of again striking the trail, but after ~~proceeding~~ about two miles encamped —

Obtained no specimens, these pine woods seeming remarkably destitute of animals. Two deer were seen but the hunters got no game. The ground has every where a good growth of grass and seems like good soil for grain —

C 19th It rained sharply during the latter part of the night and early morning. Remained encamped

August 11th We commenced descending the Eastern slopes of the mountains, and at once noticed a remarkable change in the vegetation. The most abundant and characteristic tree became the "Yellow Pine" quite different however from the species called by that name on the eastern coast. This fine tree grows over a hundred feet high and has a straight clear trunk, for forty feet above the ground, when it branches, forming a very open top. The bark is of a reddish color and coarsely ridged like that of the Chestnut. The wood is said to be remarkably heavy, and well adapted for many purposes.

The Oak ⁽²⁾ which had been rather uncommon on the western slopes was here more abundant, growing as usual on the borders of prairies. It does not seem to grow on the mountains higher than about 3500 ft. elevation. (Its general appearance is much like the White Oak, by which name it is commonly known ^{to app.} but it is lower, more branching and less valuable).

The White Pine did not extend far from the summit downwards. A few small Larch trees were seen of a species very common farther north.

There is so little underbrush in these forests that wagons can easily be driven through any part of them. ^A The most abundant shrub, almost the only one in many parts is a Ceanothus, ⁽³⁾ with shining leaves, having a very strong odor resembling Cinnamon.

Our course lay through these woods for fifty miles, and left them about ten miles east of the base of Mount Adams. Around a marshy lake where we encamped one day I obtained several very interesting plants. ⁽⁴⁾ The vegetation was however mostly more dry than west of the mountains, but ^{seemed} very distinct in character scarcely any plant being the same.

Here we first heard the musical cry of the Jay which about sunset came about our camp in great numbers. Burrows of the Badger also began to appear. Large game continued scarce, only a few deer, one Elk and one bear having been seen by our ~~men~~ hunters and none killed. I obtained from animals a specimen.

B > nos *

(1) *Pinus ponderosa* Dougl. (2) *Quercus Garryana* Dougl.

(3) *C. velutinus* Dougl. (4) *Phelipaea comosa* T. & G.

Erigeron Douglasii T. & G. *Poconia Brownii* Hbr (sachs)

Eragrostis umbellata Torr. *Acer glabrum* Torr. *Erodium cicutarium* L'Hér. ~~and others~~ add it p. 7. bottom.

* *Eutamias* no 13 *Eschsch. leucodensis*.

(C.p. 5 $\frac{1}{2}$)

Aug 20th Proceeded northward 16 miles and encamped near the Wenapa River. Crossed on the way two other small branches of the Dakina both very similar in size and general appearance to this. The trees bordering them are small Poplar and Birch, Alder, Oak, with Hazel, Cherry, and Rose shrubs, overgrown with the Clematis and Pison Vines. A few plants are still in flower along the water. Observed no new animals on the route. A kind of Pickly Pear is common, much resembling the common Eastern species but with smaller joints and spines an inch long. It is now out of flower but the fruit is not yet ripe. *

Aug. 24th. Still encamped on the Wenapa. As various different parties have gone to explore the country - The weather has been exceedingly hot the thermometer rising to 101° in the shade one day while at night it falls as low as 48°. I have walked and rode around this valley and the adjoining hills every day but obtained no animals except a few snakes.

* See Gibbs Geological Report. These terraces and the natural dams which they form to the upper valleys, may in future become important, as an aid in carrying out an extensive system of ~~irrigation~~ ^{reservoirs} in the way proposed by Chas Elliot for the valley of the Ohio, (see his Contributions to Smithsonian Publications vol.) by which both the navigation of the rivers may be improved and this otherwise too dry country fully irrigated, during summer. The abundance and immense size of the timber on the mountains will thus also be called into play.

Sept 3^d We moved camp 14 $\frac{1}{4}$ miles to the main Dakina River, crossing a high range of hill, covered with stones and fragments of basalt and producing scarcely any vegetation. Saw there some Sage fowl of which two immature birds were shot by the party. Weather cloudy and a few drops of rain fell.
(to p. 4 $\frac{1}{2}$)

+ *Crotalus luteus* B & G. Bascavon No 15 (between 2 B & G)
4 *Phrynosoma Douglasii* Gray. - ~~Sized as~~

* *Opuntia missouriensis*. D. C. I noticed it growing abundantly up to lat. 49 on the Kanagans -

Aug 16th After five days in the Pine Forest and
 duly rode out from it upon the open plains, the trees
 ending so abruptly that we could not perceive the ^{plains}
~~country~~ until almost in ~~them~~ From that point (eleva-
 ted still 3000 ft. above the sea we overlooked a vast
 brown and barren looking country, undulating before
 us as far as the eye could reach. Narrow winding
 lines of trees, marked the course of small branches of
 the Columbia, which itself was hid only by interver-
 ning ridges. A more striking contrast to the other
 side of the mountains could not be imagined.

Having now reached this open country our course
 took a more northerly direction crossing the spurs of the
 Range until we reached the Columbia River at its
 Great Bend. The whole of this tract has a similar
 character. The summits of the ridges are generally
 bare, composed of volcanic fragments and supporting
 scarcely any vegetation. Scattered bushes of Greas-
 wood ⁽¹⁾ with a little black-grass in places, formed
 almost the only green vegetation visible.

Descending to the valleys successive terraces ^(*) appear
 at first covered only by Wild Sage ⁽²⁾ and other plants
 unfit for pasture and indicating a barren soil, but to-
 wards the bottom producing a dense growth of grass.
 Along the banks of streams a few Pines, ^{Oaks} small Spruce,
 Birch and Willows, with occasionally stunted Ash and Ma-
 ple trees were the only remains of the immense forests
 we had left. Here also were found the only plants
 still ^{in a state of} for preservation as specimens, which were
 mostly of species peculiar to the Central Basin and
 the Plains bordering on the Rocky Mountains ⁽³⁾

A) On the higher grounds the "Sage Fowl" was common
 while the Sharp tailed Grouse formed immense flocks
 in the valleys. Badgers and Coyotes were the largest
 animals seen, but wolves, otters, weasels, squirrels etc were
 not uncommon. I obtained several species of snakes
 different from those before seen, but Rattlesnakes, so
 abundant in other parts of the Plains were rather
 scarce. Scorpions, the Buffalo Cricket, and myriads
 of grasshoppers were among the peculiar insects.

†) Cleaned roads of one species were abundant.
 (1) *Purshia tridentata* D.C. (2) *Artemisia tridentata* Nutt.
 (3) Among them ^{page 6} *Calochortus macrocarpus* Dougl. *Gilia pul-*
chella Dougl. *Eriogonum Heracleoides* Nutt. *Mentzelia levis-*
aulis Torr & Gr. *Pentstemon procerus* Dougl. *Eriogonum mi-*
crothecum Nutt. *Linum* Dougl. *Trinosyris albicaulis* T. & G.
 and most of the other ^{plants} mentioned in Catalogue
 of plants collected East of the Mountains.

The valley of the Yakima is here about 12 mile wide, and apparently superior to the smaller ones in soil. The river like all yet seen flows over a bed of volcanic pebbles. It is here ~~wide~~ wide and from two to four feet deep at this dry season. Very large portions of the valley seem to be overflowed at times and it is full of deep channels of what must be in winter considerable branches of the river —

More pines than usual grow near the water and the trees are of larger growth generally as if in proportion to the size of the river —

The whole country has a pleasing appearance but the soil of the upper terraces is very poor and stony —

B. Sept. 16th To-day I caught with a hook several fine trout of the black-spotted species, and a fish of the Sucker family but with a soft hoglike snout. Also a rare and small fish which is preserved with the others (*P. 8) The day was cloudy with slight passing showers.

^(19th) While fishing for trout ~~in the 15th~~ ^{yesterday} I was as unlucky as to get among some of the Poison vine ⁽¹⁾ of this country, and next morning, had my face so swollen that for three days I could scarcely see ~~while~~ the constant burning pain made travelling in the hot sun anything but pleasant. I was told by some of the party that in California a kind of Nightshade (*Solanum*?) was used as a remedy for this but as none grow here I had to stand it out —

Today, all the parties having again collected we started northward and travelled 8 1/4 miles to the foot of the mountains where we encamped at sunset —

(1) *Pohos. diversifolia* T. & G.

I remained at the camp with the main party for two weeks ~~the Wenatchee River and two miles on the main Yakima~~. During all this time I obtained ~~several~~ ^{several} specimens, though I walked and rode out every day around the camp. * The great heat ~~and dryness~~ ^{and dryness} ~~in the shade~~ ^{in the shade} seemed to have driven almost all the birds to the mountains and the reptiles to the ground.

I however obtained here the first specimens of the interesting American Nutcracker ⁽¹⁾ and of Buffalo Whippoorwill ⁽²⁾.
B * Several species of trout and other fish, beside some snakes which I caught were unfortunately destroyed for want of a proper preservative. My alcohol having leaked out from one of the cans, I tried the preparation known as "Goadby's solution No 2" but perhaps from being chemically decomposed in the river water used, it failed entirely. I afterwards obtained some miserable whiskey brought by Lt. Brown from the Dalles with which I made out to preserve ^{some of} what I collected afterwards.

Mr Gibbs in an excursion to the headwaters of the Yakima observed the skins of the Mountain sheep, a large species of marmot, and some other animal not found by us elsewhere. He brought me from there the skin of a large "Sucker" which was among those sent. He also saw what he supposed might be the Imperial Woodpecker, but could not obtain specimens.

On the 13th ^{Sept} I rode about 15 miles up the river and back again but obtained no specimens and saw scarcely anything living. I found the forest as abruptly defined on this part of the mountains as where we left it, and the trees similar, as well as the general character of the scenery.

Sept. 20th We crossed the high spine separating the waters of the Yakima from the Upper Columbia and the "Disquouse". From the summit of this ridge we had a panoramic view of the country towards the north.

Westward the numberless and irregular points of the Cascade Range might be compared to the confused waves of a rough sea. Below the highest snow covered peaks was a belt of forest corresponding to that along the whole range, and lying between about 3000 and 6000

* *Melospiza labradoriensis* ^{sage} *Seto borealis* ⁸ *Tetras ussuriensis* ^{Bp.}
(1) *Nucifraga columbiana* Wilson. *Antrostomus Nuttallii* Aud.
Astur leucopus Bp. *Pica melanoleuca* Vill.

+ *Salmo* Nos 3-4-5 Fish Nos 6-7-8-9-10 *Pitheophis Wilkesii*

B. While descending along the Methuen valley we saw two coyotes, quite a rare sight for us though they are so numerous elsewhere on the Plains.

A. There was little to see or to collect in my department along this part of the river. As a specimen I quote my notes for the 25th. "Travelling 14 miles, ~~crossing~~ a steep point, by ascending the almost perpendicular side of the ~~or~~ canon to an elevation of about 640 feet on the summit of which we found a pretty valley running back among the mountains, and following this for 2 or 3 miles, were much surprised to see before us a large and beautiful lake, with extensive rolling prairie and fine groves about it. This which was not on the maps we found to be the 'Chelan' about 30 miles long according to the Indians and extending back between high and steep mountains, in rapids at their bases. We crossed near its outlet where it is so shallow as not to rise above our ~~ankles~~ and emptied into the Columbia by a very short and rapid stream, the 'Entecatecoma' of Wilke's maps. I looked in vain for any shells along its shores. I obtained today the second rattlesnake, ^{one met with the} which seems different from any described. Another was killed said to be different ^{from this} but I did not see it. I saw on the lake a few ducks, and in the prairie some Prairie fowls, the highest point where I have met with them.

feet elevation - Below this the rugged and barren outline of the mountains was continued down to the west bank of the Columbia, a few spurs being cut through by it - All the remaining country was one immense brown undulating plain consisting of that elevated basaltic tableland lying east of the Columbia. Only at one point were any trees visible, a few covering the highest part of the Table in the distance ~~and~~ opposite to the mouth of the Okanogan.

No Arabian Desert could have a more desolate appearance than this Plain at the season we visited it - But in early spring it is ^{said to be} covered with verdure and multitudes of beautiful and useful plants, make it a natural garden.

On this high ridge we first observed large trees of the Larch ~~P~~ ^{beginning to be} ~~more~~ ^{even} abundant than the Pines. It is a splendid tree often six to eight feet in diameter, and its light elegant foliage, which was then beginning to fade, is much more beautiful than that of most other Coniferæ.

Descending to the banks of the Columbia which here ~~emerges from its usual course~~ ^{enters} upon the lowest portion of the Plains, we travelled for five days along its western ~~bank~~ ^{slope}, by a trail almost impassible in places, where several of our pack animals rolled down the steep ~~sides~~ of the Canon and were killed. We then spent seven days in exploring the valley of the ^{Methow} ~~Puget~~ River. This is more fertile in appearance, and one of the most picturesque regions seen in our journey - Grassy terraces rising successively above each other, are surmounted by hills partially wooded. Considerable timber also grows at the edge of the river - in this valley. Animals of all kinds were scarce ~~along the path of the route~~ ^{near the mouth of the Methow River}. Scorpions were seen ~~near the river~~ but the reptiles peculiar to the plains were uncommon perhaps from the lateness of the season. * Frost had begun to change the leaves of the few deciduous trees - and a few birds appeared to be migrating. The weather generally was however ~~much~~ milder than in latitudes much lower on the Eastern coast.

I preserved only one bird the great Horned Owl (*B. occidentalis* Nutt.)

* (A great) Salmon were abundant in all the rivers after we reached the Puget Sound. They appeared to be of two or more species, some being four or five feet in length - ~~in the higher part of the river than we reached, but were there so many, such by and more out that we would not take them.~~

A Oct. 8th Continued on for 15 miles up the river.

At camp, there were in the river, blue deep and narrow great numbers of Salmon about two feet long, which seemed nearly worn out by their long journey from the sea, but still kept swimming up stream as long as they could. Their tails and fins were actually worn off to stumps and their color had changed to a bright red mottled with white which made them very easily seen. They paid no attention to us and were probably blind - Many dead ones lined the shores and were devoured by Ravens etc.

B Caught in the lakes at the 4th where we camped during the 10th some fish of the carp family, about a foot long, said by Mr Gibbs to be the same as in the lower Columbia - I walked about the forest for some hours in hopes of getting new birds, but saw only a few Bluebirds, Jays, Nuthatches, & Woodpeckers, all of species before obtained.

The woods are here open and beautiful much resembling those near the base of Mount Adams. The soil sandy, good grass, and abundant water.

There was the only pleasing country we had seen along the Columbia since leaving Vancouver, and it resembles much that along the smaller branches though more wooded. The soil is also very good in many of the valleys around, and we obtained from the settlers, & discharged employees of the Hudson's Bay Co. very fine vegetables.

The weather is fast becoming colder and there is heavy frost every night. The thermometer this morning the 22nd fell to 21° Fahr.

About here are a few small trees of the Paper Birch and also of a Pinus, neither seen before. They seem to be the outposts of the Rocky Mountain forests. Some Spruces also occurred apparently the White and Black species of the East.

Chapter II. Okanogan River to 49th. Fort Colville
Great Plain. Snake River. Walla Walla to Vancouver.
Review. *Oligoneura* etc.

Oct. 4th We again reached the mouth of the Okanogan
River which we had left to explore the ~~Snake~~ ^{Mathews} valley.

Here there is a flat sandy barren tract surrounding the
Fort, while on the opposite side of the Columbia the
perpendicular cliffs of the Central Plain rise to a great
height and are covered at the summit by a small
forest. About this portion of the route I collected
no less than five distinct species of *Artemisia*, ⁽¹⁾ that
genus of plants so characteristic of the Plains —

A The Valley of the Okanogan ~~in which our falls are~~
~~from its mouth to the 49th~~ is more capable of cultura-
tion than most of those we had yet seen. It is wide
and bordered by undulating grassy hills, which towards
the north become mountains, approaching each other gradu-
ally, and covered especially on their northern slopes by
forests of Pine, Larch, and Spruce. The River unlike
any other we met with is rather slow, expanding into
shallow lakes in its upper part, and the water is of a
brown color from decaying vegetation. I found in

B ^{these} several large and interesting kinds of shells, of
which I had hitherto observed only three species*.

Oct. 12th left the Okanogan River and travelled east-
ward across the mountains towards Fort Colville.
This country was of better character than common
well covered with grass and diversified by groves of
fine trees along the streams. Game of all kinds appeared
scarce and I obtained no specimens of animals.
Arriving at Fort Colville on the 18th we found the
Columbia there flowing through a narrow valley with
small tracts of fertile land along its banks and
hills rising on each side thickly covered with trees.

B. 7 Birds were more common than at any previous time
and I obtained here the Pigney ⁽¹⁾⁽⁵⁾ *Metabata* which
was abundant at this far northern locality late in
October. Of other migrating I first noted at the time
the following. *Mergus*, species — Green-wing teal, blue winged
Teal ⁽²⁾ a Gull, ⁽³⁾⁽⁴⁾ Water ouzel, Patchou bird, ⁽⁴⁾ Mallards,
Robins, Flickers, and Jays. Flocks of Killdeer passed
over at night. The Ruffed Grouse was common in thick
ets and the Sharp-tail abundant in the prairies.

* *Lymnaea* *Physa* *Planorbis cornutus*

(1) Mentioned in the catalogue *Aes. stragulus* ^{serotinus} ~~serotinus~~ ^{buqueti}

(2) As I have not since met with this, the specimens I
then shot may have been the young of the Mexican teal.

L. cyanoptera since obtained near the falls by Dr. Duck
Lay — (3) *Trarus zonorhynchus*? Rich. (4) *Trarus Ludovicianus*? F.

(5) *Sitta pygmaea* Vigors

At Colville the temperature was much higher than
that of the Columbia which was then 52°
(see next morning's report)

A 24th At daylight there was about four inches of
snow on the ground and it was still falling.
Air milder than in the morning. We travelled $8\frac{1}{4}$ miles and
encamped on the border of a prairie on a branch of
the Spokane River, near the old mission farm of the ^{Chippewas}
~~Indians~~ now deserted.

Oct. 2nd we left Fort Colville and travelled south-
 by towards the Spokane River. The weather had now
 become very cold the thermometer falling a low as
 18° at daylight, but there had been scarcely any rain.
 On the night of the 24th about 5 inches of snow fell
 which thawed off in a day and the air became milder.
 The country was ~~now~~ more level and fertile than
 before with prairie and forest intermingled.
 On the 26th we encamped on the banks of a small
 stream near the Spokane River and at the commencement
 of the Great Plain. The vegetation here though the
 dry was abundant and groves of trees lined the stream
 consisting of Pines, Larch, and some Spruces ~~and before we~~
~~at Fort Colville I also noticed the Paper Birch and~~
~~a large Juniper which with the Spruces seem to be~~
~~long to the forests of the Rocky Mountain ranges.~~

(3) I shot at this camp a rare species of wood pecker.
 Sage-fowls were abundant on the plain and a flock of
 the Blue grouse was seen in a grove near the Spokane
 River. I saw a Bob-fox here and another was killed by
 one of the men but I did not see it in time to save the
 skin. On the 30th Oct. Lieut. Donaldson having arrived with
 the eastern division of the Party we again started to
 cross the Great Plain, which took five days in which we
 travelled seventy miles. The surface is undulating and
 grassy with occasionally alkaline lakes, and but little
 good water. Portions are crossed by deep canyons with
 columnar basaltic sides, and the ground covered with
 fragments of stones, so as to be in places entirely barren.
 The elevation above the sea gradually descends from
 2572 ft. near the Spokane River to only 409 ft. at the
 Walla Walla which is its lowest part. The highest
 is probably nearly opposite the mouth of the Ukan-
 gan. At the time of our journey there were very few
 animals seen here. I obtained several specimens of birds
~~(which were not new though some of them is a rather un-
 usual situation on these plains)~~ (4) I noticed a single flock
 of a small Mountain Lark (5) but could not obtain specimens.
 From a high hill near the middle of the Plain I could see
 no mountains or trees towards the west, though the air
 was very clear, and nothing to obstruct the view.

- (1) *Betula papyracea* Riton (2) *T. occidentalis* Hkr.
 (3) *Melanerpes albolavatus* Fes. Cassin ^{also} M. Harrisii Aud.
 (4) *Otus palustris* (5) *Otocoris* ?
 and pursued *Tetrao phasianellus*, *Geoprocnyx auctus* Bd.

A. The ~~trous~~ plants here seemed much less affected by the frosts than northward, and I ~~collected~~ ^{collected} saw red and aster still in flower. The weather has become quite mild. The thermometer at P. being at 48° and the sky is overcast.

Many of the plants seen here were new to me this being to be a natural boundary to them but they were so withered that I could get little except the seeds. ~~where they~~

Towards the east the Bitter Root range of mountains
was visible apparently covered with forests -
The vegetation of the plain though dried up, seemed to
be similar to that about the Dakine River, consisting in
part of Artemisia etc, but with more grass.

Large flocks of Ducks and Geese were seen in some of
the alkaline lakes but could not be approached.

On Nov 4th we crossed Snake River some distance
from its mouth. It here flows through a deep Canon
without any trees for several hundred miles along its
banks, and though such a long river is so shallow and
interrupted by rapids as to be unnavigable.

A7 Proceeding south from ~~here~~ ^{here} we reached the ~~mouth~~ ^{valley} of the
Walla Walla, and followed them down
to the foot of that name. This quarter of the country
is among the best we saw, the hills being well covered
with grass which having been burnt over, was beginning
to grow again with increased strength, giving them the
beautiful verdure of spring. Timber was however so
thin & scarce, the trees along the streams being mostly
cottonwood and other Poplars.

Towards the mouth of the Walla Walla the soil becomes
poorer and alkaline in many places producing several
plants which I had not before met with. (15)

Fort Walla Walla is surrounded by barren sand-hills
producing the largest plants of the group peculiar to
these deserts that I had yet seen. About here we
saw and heard a remarkable number of Wolves and Coy-
otes which seem to hang about the forts to pick up the
stray horses and cattle they can find unprotected.

A few of the large horses found in this region were
also seen but none shot. The Indians say that
some disease had killed off most of these animals.

The Columbia River here re-enters a Canon with basaltic
cliffs 500 ft. high which continues almost without
interruption to Fort Dalles a distance of ninety miles.

For eight days we travelled along this Canon sometimes
following along the narrow strip of detritus at the foot
of the cliffs and then being compelled to ascend to
the summit of them, to pass by positions where the river

(16) *Sarcobatus vermicularis* Torr. ~~and other~~ over)

A The violent west wind said to be constant here at this season blew clouds of sand in our faces, and added to our disgust with the country and our desire to get into more hospitable regions - Nothing could be more bleak and barren than the whole prospect on all sides, and scarcely any wild animals were seen on the land - A few Golden Eye and Buffed head ducks were on the river. J. V. X. P. 13

Even the branches we crossed at their mouths were destitute of the fine valleys elsewhere seen, but are said to improve towards the Blue mountains

B This region including so great a part of the United States west of the Alleghenies, and characterized by a Flora & Fauna so markedly distinct from that of the Great forests of Canada and of the Eastern United States; ~~and which is prolonged~~ on the mountain ranges far so the west, seems to be bounded by the latter in this Central Basin by an irregular line running between the 48th and 49th degrees, undulating with the elevation of the land, so that the two are interlocked, as it were the lower parts belonging to the "Plains" physically while the higher (above 3000 ft.) belong to the Canadian Province. And above this is the Alpine corresponding to the Subarctic or Boreal Province having many of the same plants, or those strictly analogous.

In progressing southward as is well known the elevation of these regions increases, so that in California near lat. 35° there is scarcely any difference in the vegetation at a height of 5000 ft =

flow close to their bases. The elevated level plain 200 feet above the river is mostly a barren, sandy and stony region with very few plants of any kind growing.

A I found along this part of the river several plants in flower which I had not before met with.

The Hackberry, ⁽²⁾ was the largest tree, and with a few small willows supplies the only fuel to be obtained. At one point only on a very high position ^{near the mouth of the} of the cliffs we saw a few ~~plants~~ and to be a kind of Juniper.

At the Dalles there is a great depression of the surface, so that the Columbia, often overflows its deep but narrow channel which looks like a canal cut through solid rock.

Here we found the forests of the Cascade mountains again commencing, the Oak being very abundant and extending for several miles further onto the plains than the Pines.

The weather had been milder here than at Fort Colville and there had been no snow ^{and} but little rain. There was heavy frost at night at the time of our arrival, ~~there was a cold sweet wind blowing almost constant~~ ^{clouds of snow} ~~by our faces~~ ^{the journey down the river very pleasant}.

* I obtained along the river ^{a third} another species of owl ⁽³⁾ and a rare arcton species of Grebe ⁽⁴⁾.

It is evident that these last a march as ours had been since we left the camp on the Yakima but little opportunity ^{was} afforded for collecting specimens. While in camp, though I had plenty of time, the location and season were so unfavorable that I was very much disappointed in the results. After September when birds began to be more abundant and we were travelling through a country much richer in animal life, many circumstances prevented me from doing as much as I wished. Our marches being long and rapid did not admit of delay while on the way, and after camping about sunset, there was little time for going in search of specimens, besides preparing them. And my medical duties though not some were troublesome as I had to compact the medicines at almost every camp in order to get at something. I mention these as a few of the obstacles ^{travelling} the naturalist meets with, which are little appreciated by those who stay at home.

(2) Celtis reticulata Torr. with ripe yellow sweet berries.

(3) Cleome lutea Hkr. Tinusoria viscidiflora Hkr.

Adonia mellifera Dougl. Helianthus autumnale Tinn.

(3) Otus Americanus (4) Podiceps occidentalis Bdt.

p 19 $\frac{1}{2}$ About the end of March I received notice of the disbanding of the Expedition, and my consequent discharge. But I had become so much interested in this new country, so pleased with its climate and with the freedom of a frontier life, that I concluded to remain some time longer, hoping that the Survey would be renewed, in which case I had the Governor's promise of further employment.

And in order to economize as much as possible and to have an opportunity of making at least my expenses by my profession, I ~~resolved to stay at this Bay at least~~ ^{resolved to stay at this Bay} for the present, ~~and~~ ^{while it also secured the best} locality I had yet seen for collecting on the coast.

p 25 $\frac{1}{2}$ Though there now seemed to be little prospect of a continuation of the survey, I felt anxious to spend the winter on the coast hoping thereby to obtain some specimens, especially of more northern birds which I thought would be almost sure to appear during the coldest season. And I still hoped that an opportunity would offer next spring by which I could return overland and make collections in the interim at a more favorable season.

* A more complete and interesting description of this part in winter is contained in the Report of the 2nd Expedition of Col. Fremont, who spent several days in it, with the advantage of clearness that —

Nov. 17th We left the Dalles in a small steam boat and arrived at the Cascades about 8.30 P.M. The banks rise rapidly higher and higher very near the Dalles and the whole Gap of the Mountains presents the character of a Canon with perpendicular walls, excepting a few intervals where the steep mountain slopes form the sides of a narrow Valley. Trees also become suddenly abundant and with all the varieties peculiar to the Puget intermingled, with much less of the defined limits observed on the summits of the mountains. From the Dalles a thick fog could be seen hanging in the Gap, and over the mountain tops, but we were quite unprepared for the heavy rain we ~~encountered~~^{met} long before reaching the Cascades and which continued unceasingly for the whole night following. Even after entering this rainy place we could see the bright blue sky, still clear and dry towards the East. The moist, and mild temperature was ~~rather~~^{however} agreeable after the dry, cold climate we had so long been travelling in -

In fact the change in the distance of a few miles was at that season, ^{almost} as great and striking as I have since experienced between the climate of New York in January and that of the Isthmus of Panama. The tropical appearance of the country was also heightened by the perpetual verdure of the ^{gigantic} forests and the occurrence of many kinds of spring flowers.

The large leaves of the Oregon Maple, and others, ~~the tall~~ Ferns, always green, rising above one's head, ^{the many beautiful evergreen shrubs} the moisture, and darkness of the forests, all add to the feeling that the climate was one of perpetual spring.

There seems to be no evidence of any original superiority of the soil west of the Cascade mountains. The Rocks are generally the same, ~~and~~ even the perpendicular basaltic cliffs, so bare and desolate towards the Plains are here almost concealed by a rich vegetation occupying every fissure, while mosses and lichens cover the face of the rocks. At the same time the various Poplars and Willows which Eastward formed the only large wood along the margin of the rivers here continue, showing that Moisture is the one great requisite to produce a luxuriant Forest -

* *Fragaria vesca* Linn. *Geum* sp. *Troda* sp. blue and yellow
Ceranium Carolinianum Linn

I have prepared my preliminary Report and notes on specimens, which ~~after~~ ^{having} ~~being~~ ^{seeing} them rather ~~early~~ ^{but for} I have since obtained materials for making these more complete they now appear in an entirely new form

B.

It was also impossible to get specimens of them without paying the Indians more than they cost in the Eastern markets; and I thought my own time was better occupied in looking for the land-birds.

A In the thickets near the town and on the neighboring cultivated lands most of the birds were found, and though I several times went into the forest and to prairies some miles distant I found nothing to repay me. The small birds seemed already to have found the advantages of remaining under man's involuntary protection, and all that season found more food in such places. The nesters, for on the other hand, being constantly hunted nearly by, & though flying about in great numbers it was very difficult to get near them.

3 In fact I may say that ^{December} ~~the winter~~ ^{more} ~~was~~ ^{pleasant} ~~at~~ ^{than} the month I spent ^{here} after my arrival in June, excepting the few cold days and a little too much rain being cooler and but little more rainy.

* A list of these is interesting to show the much greater number of winter residents, compared with a corresponding point on the eastern coast which would be Montreal. ^{*Sitta occidentalis* Townsend} *Empidonax* *Oregana* *aud.* *Regulus* *calendula*. *Troglodytes* *Brewickii* *Parus* *carolinensis* *aud.* *Perisoreus* *columbianus* *Wils.* (in the coldest weather only) *Picus* *harisi* *Colaptes* *auratus* *can.* *Troglodytes* *uniflorus* *Caprimulgus* *virgatus* *L.* *Turdus* *macurus* *Luscinia* *hudsonica* *Agelaius* *phoeniceus* *L.* *Passer* *stelleri* *Sturnella* *neglecta* *aud.* *Turdus* *migratorius* *Parus* *rufescens* *Ammodramus* *laevis* *Larus* *boréal*

From the Cascades we descended the river in open boats to Vancouver in the midst of rain; arriving there about midnight. I could make therefore few observations on the character of the country among the mountains —

At several points we could see the lofty Cascades from which the Range takes its name pitching down hundreds of feet over the cliffs in unbroken sheets — Towards Vancouver the River widens out and becomes shoal, in many places forming low sandy islands covered with Poplars and other ~~low~~ vegetation which can withstand the annual summer inundations —

I remained at Vancouver three months, excepting an excursion of ten days up the Willamette River as far as Oregon city. My collections during this time consisted principally of Birds of which I obtained twenty four species principally land birds of small size — *

A) The Water birds which were abundant during part of that time I neglected, as they were all of well known species and mostly common to the Eastern Coast —

B) I also prepared a fine specimen of the Cougar which was unfortunately lost afterwards —

As that winter was one of the coldest on record in that country I will give a short account of it —

From Nov^r 18th to Jan^y 4th the weather was mild and rainy, as usual in winter there, but with many bright warm days as pleasant as ~~usual~~ in summer. There was often slight frost at night but not enough to stop vegetation, and the prairies were clothed in their richest green, ornamented by various flowers —

3) Jan^y 5th there was a fall of about two inches of snow and the rest of the month was cold and often bright for two or three days together an E. or E. wind prevailing, instead of the usual winter Southwest breeze — More snow fell on the 12th, 18th, 20th and 24th making in all about four inches which remained on the ground for two weeks —

By the 24th the Columbia was frozen up with ice about 9 inches thick, and remained closed till Feb^r 10th. After that there were a few light showers of snow, but the usual warm rain prevailed and little more ice formed — not enough to obstruct navigation —

The last snow I saw was on the 30th March when the hills of the coast range were whitened with it for a few hours, though rain only fell at the level of the sea —
+ Feb^r concluded —

Among them *Coccyzus mexicanus* Cooper. *Pipilo oregonus* Bell. *Zonotrichia townsendi* Aud. ? *Luscinia s. s.* *Haliaeetus leucacephalus* before this more seen which were not obtained —

For about thirty miles between the towns of Rainier and Cathlamet, perpendicular cliffs of Columnar Basalt line the banks, alternately approaching and receding from the river and apparently rising at their highest parts to 2000 feet elevation. These form the main Coast Range, but there is no definite central ridge, the mountains being ~~arranged~~ ^{scattered} without any order —

Wide strips of good alluvial land lie along their bases and in the valleys between, but at that time very little was known of the land a little way back.

Prairie of various extent can be seen from the river upon the high mountain slopes here and there and as far down as Oak Point quite extensive ones occur along the bottom land and on the islands. From there down there begin to be of the character of tide lands, but are ~~very capable of cultivation~~ —

Time and ever changing scenes succeed each other with all the variety of mountain country —

2 I was obliged to wait at Etowah three days for an opportunity to cross the river. I was struck by the larger and much more luxuriant growth of vegetation here than at Vancouver, and found also that it was more advanced, many ~~spring plants~~ ^{plants} beginning to show signs of their spring growth —

3 The air was mild and moist with full ~~or~~ many pleasant days as rainy ones — I was pleased with the variety of scenery and of natural products occurring about here. The forests covering the hills are disappointing and the hills around are more open and less fertile than near Vancouver, and no great extent of them is killed by fire —

1854 Feby. 20th I descended the Columbia in a steam-boat to Astoria, intending to make collections on the coast of the Territory under orders from Capt. M. C. Bellan. Noticed on the way many Camosante, flocks of Swans and a few ducks. The day was cloudy but not raining. After passing the Coast Range the River again widened, and more low Islands were here covered not by Poplars, but a species of Spruce not before observed which is also the principal tree along the banks, growing down even to where they are overflowed.

The darker green hue of this tree, its dark trunk, and the long gray moss hanging from its branches give the forest here a much more sombre appearance than above.

The Steamboat having anchored during the night a little below Cathlamet we passed through the lower part of the river in the morning arriving at Astoria about 9 A.M. Irregular spurs of the Coast Range border the river almost all the way, but present mostly steep and densely wooded slopes, ~~instead of the perpendicular cliffs~~ ^{observed} ~~the river passes through it~~.

A cold fog surrounded us until about 7 P.M. when a bracing N.W. sea breeze cleared it away, and the sun shone bright and pleasant upon the entrance to the great River. The delightful salt sea air which old associations made particularly pleasant to me, was even more refreshing than the dry mountain climate I so much enjoyed last summer.

~~From Astoria I crossed the mouth of the river on the 24th to Baker's Bay, where I was hospitably entertained for two weeks by Mr. J. D. Hotman, to whom I am indebted for much assistance in procuring my collections.~~ Obtained while there several interesting specimens, as mentioned in my notes.

37 On March 10th I crossed the narrow neck of land separating the Columbia from Shoalwater Bay, where I expected to have better opportunities for collecting the peculiar productions of the Coast. I remained there until the disbanding of the Expedition on the first of April.

(1) *Abies Menziesii* Lamb. ex.

On the western slopes are several ^{open tracts covered} ~~tracts of~~ prairie and along the ~~seaboard~~ ^{Pennsylvanian} extending north from the Cape is considerable sandy prairie. The lower damp soils are covered in many places by extensive groves of Alder and other trees easily cleared off while the soil appeared much better than up the river.

A variety of evergreen shrubs adorn the forests which I will hereafter more particularly mention, and as early as Feb. 25th the Willow and Alder began to show their flowers. The waste lands, with their dense and rich growth of grass were becoming quite green, and the cattle feeding on them, with here and there the comfortable house of a settler gave them quite a pleasing and homelike aspect.

The immense straggle of the Columbia river then beginning to enter the river and I saw several from four to ~~10~~ feet long taken by the Indians.

I have never seen anywhere a river mouth comparable in scenery to that of the Columbia.

From the top of the Cape, two hundred feet high it is unlimited to seaward except by the horizon, and sharks, seals, and ~~coastwise~~ ^{seabirds} may be watched as they play among the breakers at 1000 feet.

A few steps back, and the calm glass like water of Bakers bay are seen gently washing a smooth sandy beach, so protected that scarcely any strong waves ~~a ripple on the surface~~ ^{surface}.

Looking across the river, with its ~~many~~ ships and steamers and the numerous houses already dotting its shores, we see the long low beach of Point Adams, backed by dark hills, above which rise the strange and snowy peaks of Saddle Mountain.

And whether summer or winter the view on clear days is so similar that one could hardly guess at the season from the changes of the landscape. *

(** I will however make occasional extracts from my notes where descriptive of particular places)

* Specimens collected here - *Lepus Washingtoni* Bol.
Habiastrus leucocephalus young. *Tringa semipalmata* Talp.
Fuligula perspicillata m. sp. *Chara crassa* L. *Gnaris*
Canadensis - *Brevipennis americana* ~~Wats.~~

I resided in Washington Territory ~~nineteen~~ ^{nineteen} months after the disbanding of the Expedition, and in various excursions through the country west of the Cascade Mts. collected materials enough to be able to give a general description of its natural regions and their characteristic productions. This will be a more interesting and complete manner of giving the Results than that of a narrative in which much repetition is unavoidable, and the facts observed have no connected arrangement.

~~It is~~ ^{In order} to present ~~at the same time~~ ^{between} the principal points of difference ~~from~~ ^{the} Regions East of the Cascade Range, I will make a hasty Review of what is most important in the narrative just finished, ~~and state~~ ^{state} in connection with ~~the~~ ^{the} principal Geological and Meteorological influences which appear to have had a marked effect on the Natural History; ~~and~~ ^{with some} ~~draw~~ ^{draw} from the observations of others.

Commencing near the mountain summits at an elevation of 5000 feet above the sea, and a little north of the Columbia about latitude 46°, we found a region Subalpine in character, still with the vegetation of the lower valleys predominating though less luxuriant.

There may be said to be but two seasons there; Winter, continuing for eight or nine months, * while the ground is covered with more or less snow, and the remaining short growing season, hardly warmer than the average of the spring months at Vancouver. During our stay there in the beginning of August there was rain, hail, and ice, as recorded in the meteorological Report of Lieut. Proctor. There is consequently no dry season in these mountains and the warm season is short and changeable.

Still the abundant moisture favors a plentiful vegetation ~~and it is about the headwaters of the streams flowing eastward that the principal forests existed~~ ^{are found that only}. These also the hollows lying among the summits collect the water into lakes and marshes, the latter ~~are~~ ^{are} always fresh and green when all is dried up in the lower country and ~~become~~ ^{become} ~~become~~ ^{become} important as grazing tracts when the country ^{is} ~~becomes~~ more settled. For health and beautiful scenery these mountains are unequalled.

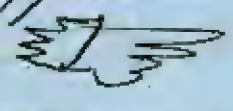
* Snow fell in the Na-chess Pass, 2000 feet lower, on the return route of Lieut. Hodge from Steptoe Pass in Sept. (12th?) 1853. In June 1st 1855 a man who drove some horses across the mountains said he found several feet of snow in the ^{same} Pass, and Dr. Suckley found it impossible to get across during that month.

The abrupt limit of the Pine forests, ^{noticed} on the Eastern slopes seems to correspond to the extent of the summer rains, ~~these~~ being intercepted by the mountain summits which condense the moisture from the Ocean. Thus ^{in descending} Mt. Adams, ~~they~~ end at an elevation of about 3000 feet above the sea, and this line continues to limit them towards the north, nearly to the 49th parallel. There however they appear to extend somewhat further down especially on the Northern Exposures of the mountains. * Along the banks of rivers they also extend to a lower level, apparently from the supply of water necessary to their growth being furnished by the rivers. The moisture of the winds blowing through the Gap of the Cascade mountains also enables them to grow further down in the vicinity of the Dalles, while the ^{some of} mountains in sight at a short distance are entirely bare. The lowest point near the centre of the Great Columbia Plain where I observed Pines is about 2000 feet above the sea. Below this elevation the whole vegetation is of that character belonging to the ~~Great~~ Plains throughout the arid and ^{sometimes} barren regions known as the Great Central Basin, of which this is in reality a part, and might be called the "Columbia Basin". P. 119. ch. ^{to p 125 B.}

The branches of the Columbia River arising at ^{before} mentioned in lakes and springy marshes among the mountain summits, soon form deep and narrow Ravines in their descent, down the slopes. Reaching the bases of the spurs we found on all the branches one crossed, wide level Valleys, with terraced sides, the result probably of the successive stages by which the drainage of a great inland sea was accomplished. These valleys elevated probably all 2000 feet above the sea have the best land of the whole region. But approaching the Central Columbia, where the union of all these streams would be expected to form a rich alluvial deposit, capable of producing gigantic forests and luxuriant herbage, we find instead the very poorest part of the whole territory. And there seems to be no reason connected with the nature of the soil to account for this except where alkaline efflorescences occur,

* I have noticed the same limitation of forests to the northern slopes on Cape Mendocino in Cal.^a.

Thirty miles south of San Francisco, the trees entirely of a different group, grow mostly on the Southern exposures, both facts showing probably the direction of the moist moisture.

* It would appear that extensive denudation has at a comparatively recent period carried off from this Basaltic Table a former covering of better though sandy soil, leaving only bare rock or fragments. (See Gibbs' Geological Report.) This I account for the superiority of the hills about the Walla Walla River which in the apparently sudden rush of water from each side seem to have occupied a sort of eddy, protected by the spurs of the Blue Mountains. 

During April I explored three of the larger streams running into the north end of the Bay and collected what specimens I could both plants and animals. The month was however exceedingly rainy and I frequently got caught in a storm. I found it very difficult to dry plants here at all times, as the damp sea air was constant even when it did not rain.

~~It is strange that the character of the country here is so different from the sudden change in ascending the small rivers in the character of the country.~~ At their mouth is always more or less salt meadow, extending as far as the tide goes, when suddenly you come to a mountain stream too shallow and rapid even for canoes, but beautifully adapted for mills. The variety of vegetation is proportionately great, and you seem within a mile to find as great a change as occurs on our Atlantic streams in their whole course from the Alleghenies to the Sea. Among the mountains there are too many striking scenes; canons several hundred feet deep and with almost perpendicular sides, and often beautiful cascades.

On the Copahue only four miles from its mouth are five falls within half a mile which descend altogether full two hundred feet.

The advantages of this Bay for huckering are these very great and will in time be important.

On May 8th I noted that "most of the Geese, Ducks, and Godwits have disappeared, and immense flocks of Tings etc are now migrating north."

* Mr Geo. Stevens says in his Meteorological Report kept at Olympia "The whole month might be called a continuous rain storm." It was probably more rainy at this Bay than there.

which is in scattered spots only. (Portions, it is true are composed of solid rock or of fragments of basalt covering rock, but these are also isolated tracts.) But similar tracts are found most of the mountain covered with forest.

* I see therefore no way of accounting for this barrenness except by the remarkably dry climate. And as evidence of this we have the additional fact that all the high mountain ranges and the lower country adjacent to them are covered by a dense vegetation. These mountains are better supplied with rain both by intercepting the moisture brought by the prevailing west winds from the Pacific, and by condensing about their cool summits that which arises from the Plains, thus forming the clouds which generally envelop them. And the accounts of other parties show that the ranges East of the Great Plain become less wooded until the most eastern slopes of the Rocky mountains are in parts entirely destitute of forest.

Here also we find that the growing season is short but ~~at a period very different from~~ ^{at a period very different from} that of the mountain summits.

As early as February - 19th Lieut. Isaves found the grass "sprouting plentifully" on the Spokan Plain while the forest he had just left north of that river was obstructed by deep snow. * From that time to the 7th of March when he arrived at the Dalles there was no snow and he found plenty of pasturage.

March, April, ^{May} and June comprise about all of the growing season, after which there is no rain of importance until the next October, and even then we found at Fort Colville, snow, while the light rains further south had scarcely started the grass except where the prairie had been burned over.

By observations for five years at the Dalles it appears that the average annual fall of rain was only 14.40 in. of which 10.36 fell from Nov. 1st to March 1st only 1.91 in. in April and May, and but 0.40 in July and August. (None is omitted in all the observations recorded) †

There is no doubt much more rain at the Dalles than at Walla Walla, the centre of the Great Plain - the Dalles being close to the foot of the mountains.

* Gov. Stevens Report Ev. ed. p. 594. † Ibid p. 414
‡ Ibid P. 80.

The collections of plants in flower after this time does not contradict the general fact as they could not be considered growing because flowering. The growing season refers particularly to the products of agriculture which must here be cultivated as in California very early in the year in the dry soils.

I did not obtain many water birds after that time and the place was unfavorable for the land species but I found a few interesting specimens before I left for Puget Sound. My notes concerning specimens, give the principal part of my other observations.

Though rain continued too frequent up to July 1st for my pursuits, the weather was on the whole delightful. Usually clear mornings began with a N.E. wind, just enough to sail with. Towards noon, the fresh N.W. sea breeze began to blow and continued till sunset, driving off the bank of fog which commonly hung off the mouth of the Bay.

As if a storm was coming the S.W. wind was a ~~sure~~ indicator, always accompanying it.

I was so well pleased with the place, the climate and prospects of the country that I selected a land claim, not knowing but what I might conclude to settle there for life.

My professional ^{al services} were constantly called for as I was the only physician among a population of about 1500 whites and many more Indians, I must say 4000.

(I have thought it probable that there is much more rain and heavy storms of wind near the mouth of the Columbia than about the Northwest Sounds, and the different character of the vegetation corresponds to this fact.)

But in the interior the weather is very pleasant as the following extract from my Journal will show.

Jan 27th. Went to Cape Shwastee and walked for several miles about there, seeking specimens * * *

The weather has been lately growing warmer daily with a S.E. wind. Saw today many frogs, striped snakes and ~~snakes~~ crawling actively about. In the evening, frogs are piping their serenade as pleasant in spring. The Evergreen Huckleberry is beginning to show its blossoms, and the buds of many trees are bursting. Everything appears like an April day at home. (L)

being throughout the territory a much dryer summer than the preceding.

+ On account of the discharge of so large a body of cold fresh water into the warmer ocean, by which the ~~fresh~~ ^{thick} fogs may be produced, which hang over there ^{even} in summer.

* *Lophos hypoleucos*, *Turdus ustulatus* ~~but~~ *Syrnium cinereum* ~~but~~ *Hirundo serripennis* ~~but~~ *Neotoma occidentalis* ~~but~~ *Tringilla saxanarum* *Sheepulas Antipus* *Tringodytes* *Syrnoides* *Tringoides* *Tringoides*

The temperature of this Region is also interesting when compared with that west of the Cascade Range. By a similar record for five years, I find that though the mean annual difference was only $10\frac{3}{4}^{\circ}$ yet the extremes were very great, the thermometer averaging five degrees higher in summer and as much lower in winter at the Dalles than at Vancouver. This of course affects vegetation and probably to some extent animal life. Indian corn grows well at Walla Walla, and even tolerably at Fort Colville, while it cannot be cultivated with any success west of the Cascades, apparently from the want of heat.

While on the subject of temperature I will mention for the purpose of comparison some other points of difference. The winter of 1853-4 of which I have already given a sketch was at Vancouver, ^{in lat. $48^{\circ} 30'$} of the mean temperature of 36.9° , at the Dalles 33.7° , at Milwaukee ^{about lat. 43°} only 21.6° and at Boston four degrees of latitude south ^{of Vancouver} it was only 26.0° . The winter of 1854-5 which I spent at Shoalwater Bay was there much milder than the previous one. There were but two light falls of snow which soon melted off, and ice did not form more than an inch thick. The Columbia of course did not freeze. Until January there was not much rain but after that a great deal fell until the following June. ¹⁸⁵⁵ From June 1st to October when I left the territory there was not much rain and the climate was delightful. As I have no records at command I can only speak in general terms of the climate ^{of that year} as it appeared to me.

But an examination of the records above quoted will show the remarkable uniformity and mildness of the climate west of the Cascade Mountains. The difference in the moisture is more important to my present purpose. While as already shown the annual average fall of rain for 1853 was at the Dalles only 14.76 in. it was at Vancouver 52.45 in in 1853, and 42.04 in. in 1853, or for both years the mean of 46.69 and at Puget Sound in the same years it was 48.79 and 59.75 in. This is sufficient to show the wonderful difference in the climate on each side of the Cascade Mts.

*Ibid. p. 79.

Of this amount some fell during every month of the year, the mean being at Puget Sound greatest in January 16.43 in. and least in July 1.13 in. At Vancouver it was greatest in January 8.71 in. and least in August 0.20 in.

* In order to show some of the facts as observed from which I have made the following general description, I insert short accounts of some of my principal journeys as noted down at the time. — The first and most important was made from Shuswater Bay across the Coast Range to Puget Sound, and back by way of the Cowlitz and Columbia River, ^{a month after} thus giving me opportunity of seeing a great part of the country.

(It occurred made the next year up the Chehalis and down the Sounds to the Straits of Juan, returning by the same route after four months exploration, I will give in connection with the account of those waters.)

July 18th 1854 A party composed of myself Capt. R. and other citizens of Shuswater Bay and the vicinity started from the Bay with a party who had just come across from the Cowlitz Valley, the first ~~white~~ men who ever crossed the Coast Range, ~~and~~ even the Indians scarcely knew the trail ^{now} having used it for twenty years. Leaving Capt. R.'s house about 4 P.M. we sailed up the Willapa, and slept the first night at the house of one of the settlers named Woodward. Next morning we went as far up as boats could go — about 15 miles and there going ashore prepared for our pedestrian journey. We loaded a pack horse with all he could carry and then each taking an axe or gun, proceeded on our way. The morning was delightfully warm, the prairie now covered by the full-grown grass, which was full three feet high, and adorned by a great variety of beautiful flowers. By dark we estimated that we had travelled twelve miles, being delayed in many places by the obscurity of the trail and the thick under brush, through which we often had to cut our way by inches. We injudiciously took a trail which led along the hill side, though we afterwards found we might have kept to the valley and had much more prairie to pass through.

That night we camped in the woods, and though we built a large fire, found it difficult to keep warm with one blanket each —

+ Some
Catantus macularius *Fringilla leucophrys* *Merula serripennis* *Muscicapa hesperia*. *M. minima* ? *M. pusilla*
Fringilla guttata *Mott.* Several are omitted which I had also before obtained —

Having now given a general description of the country east of the Cascade as far as my short visit supplied me with data for it, I proceed to describe in the same manner that on their western side, with some of its principal natural divisions, ^{as defined} ~~marked~~ by the contour of the surface, and the productions peculiar to them.

* The whole of this Western Region may be called mountainous, but includes between the spurs many fine valleys, and even the uplands, especially towards the coast, are capable of the highest cultivation. Still excepting a comparatively small portion is densely wooded with forests of the most gigantic growth and great variety of trees, principally evergreen Coniferae.

It may be divided into two great natural sections very different in soil, and in the trees peculiar to each. The first is that of the Valley, included between the opposite ~~and~~ converging slopes of the Cascade and Coast ranges, extending from the Columbia River, northward to the Straits of Da Fuca, and continuous towards the south with the Willamette Valley. I have ventured to distinguish this as the Valley Region as opposed to the Great Columbia Plain east of the mountains and the Coast Region ^{on its} ^{side} ~~east of the Valley~~.

The Soil throughout this is rocky and gravelly, the higher parts of the mountain slopes, and the river banks being in parts of almost bare rock, which becomes covered towards the lower portions by gravel, varying in depth, ~~the~~ being where exposed by natural sections along the Sound from fifty to more than two hundred feet ^{in thickness}. All this seems to be of tertiary formation, and there is little alluvial deposit on any part of it.

The only portions showing any are the sandy river banks, ~~and~~ some of the prairies near there, ~~and~~ also on Whitney's Island and on neighboring parts of the Valley near Puget's Sound*. The gravel itself is composed wherever I have seen it entirely of igneous or metamorphic rocks, being the detritus of the neighboring mountains. On some portions of the Mountain Slopes it is arranged in successive terraces particularly about the head of Puget's Sound.

* There is on these portions unmistakable evidence of glacial action, so rare elsewhere in the territory. ^{transported} Large boulders of various ^{distant} rocks lie upon the surface, and along the shores of the Sound. I found also on the north shore of Whitney's Island the teeth of fossil Elephants, but could not ascertain exactly what stratum they had been washed out of.

July 19th We left camp and crossing the river, which was here only a foot deep, we had to cut our way through thick brush for about ~~three~~^{four} miles when we struck the trail of the Cowlitz Party where they had made a canoe and taken to the river. The trail being delayed and partly cut we had little trouble the rest of the afternoon, and by sunset reached the last Prairie, near the head of the river and at the base of the dividing ridge. This is the tenth on the river, varying from a quarter to a mile in extent, each with most excellent soil, and generally level but sometimes undulating, and adapted for beautiful and fertile farms.

The soil of the land is also of good quality but more sandy, and the growth of timber consists mostly of Maple, Alder, Poplar, with in some places giant Spruces, and cedars standing singly or in groves. Much of it is subject to overflow in winter, but not in summer as on the Columbia, and none of the prairie except this last one appears to be ever overflowed.

There the Cowlitz party had met with a drove of Elk and had killed five on the morning they came through. Some Indians who had followed them were still feasting on the remains, and the immense skulls with horns still in the velvet showed that they were all well grown bucks. The Indians having deserted this valley for many years from superstitious fears, because the tribe had been nearly all destroyed by small pox; game had become abundant, and though some Deer and Elk were seen by us, the noise of axes and of sawing men prevented us from getting any.

While we slept a party of great grey wolves came around us, no doubt astonished to see such strange visitors. The moon shining brightly one of our party saw them and at first took them for the Indians horses, but when he got up to look closer they scampered across the prairie, and there made a most diabolical howling concert, as if disgusted with the intruders.

I saw but few birds in this valley, they being as I have elsewhere observed even in the forests and land birds generally preferring the drier climate of the interior in summer.

The drainage of such a soil is of course very complete and it becomes very dry in summer notwithstanding the continuance of rain through every month — But this dryness is not sufficient to ^{harm} ~~harm~~ ^{harm} the growth of the farms, nor does it much interfere with the cultivation of the prairies, particularly adapted as they are to the production of the finest ^{Corn} grains of all kinds. Vegetables, especially roots, grow in the richer alluvial soil, larger and finer than any I ever saw elsewhere, and good potatoes can be raised on any part of the prairies.

The soil of the ~~coast~~ ^{drift zone} from near the summit of that range down to the seaboard is of a much more character, being composed of alternating beds of sand and clay, also of great depth; at the coast around Shoalwater Bay having a thickness of over two hundred feet as exposed in the cliffs. This formation appears to be mostly a very recent ^{tertiary} deposit, containing fossil shells of existing species with a few not now living.*

* Next below this there is found near the mouth of the Columbia river Secondary limestone containing fossil shells of the Nautilus family and others now long extinct. Beneath this, which seems to be comparatively limited in its extent, are the primary rocks. Between it and the ~~tertiary~~ deposit, is in many places a layer of basalt, evidently poured out over it and about Shoalwater Bay, lying directly beneath the tertiary sandstone.*

The alluvium is generally deeper and more general than in the Valley Region, and ~~the~~ even the hills are covered by a rich vegetable mould and are among the richest portions of the arable land. They are however so densely covered by forest as to require much labor in clearing. The vegetation as ^{my collections} ~~shown~~ ^{show} is generally of different species from that eastward.

Considerably more rain falls near the coast than in the Valley Region, which added to the more temperate character of the soil, adapts it for different products, though almost all the same crops grow even more luxuriantly than there, especially in seasons drier than common, like the summer of 1855.

* This is the rock called "Boulders" by Mr Gibbs in his "Reconnaissance" but from closer examination of it in various parts of the Bay, I am satisfied that the rounded form is caused by the peculiar tendency of the rock to form spherical masses in crystallizing, and where the waves have washed off the loose sandstone, ~~these~~ appear like boulders, more or less separated by the water.

July 20th Starting again at 9 AM we ascended the dividing ridge and after a slow journey, after having to clear a way for the horses, we reached a prairie called "Wohache" on the Chehalis about sunset.

The divide is not very high, the slope generally easy and the woods often clear enough to drive a wagon through without difficulty. With a little work a good road can easily be constructed.

As soon as we struck branches of the Chehalis, summing from the eastern slopes we found a marked change in the forest. The soil became very suddenly gravelly, and the trees almost exclusively the "Red Fir."

The prairie also showed a very different character, resembling in soil and vegetation those near Vancouver, ~~the latter~~ ^{and} being much less luxuriant than on the Willapa. Solid rock in situ in the stream appeared to be a variety of Gneiss with veins of white quartz? Somewhere there are said to be deposits of coal of good quality.

July 23rd We have been for three days struggling across a ridge between the two branches of the Chehalis.

The distance cannot be more than eight miles, and the height is not great, the surface being undulating and nowhere too steep for cultivation.

But the Fir forest having been killed by fire, about three years ago, logs have fallen in great confusion and the underbrush growing up has made it very difficult to clear a way for our horses. Alone we could easily have crossed in half a day jumping from log to log and scarcely ever touching the ground.

This morning at last, being almost "used up" and having gone without food for a day we were rejoiced to meet a party from the other side, who had come to assist us through, one of our party having gone round in a canoe from the other branch to inform them of our coming.

Reaching "Boisfort" Prairie about 9 o'clock we were delighted at the warm reception and hearty dinner soon provided by the generous settlers who divided us among their eight families, with a pressing invitation to remain as long as we could.

We saw abundance of Bear "signs" on these hills but were not lucky enough to meet any, and could get nothing to eat except delicious black and Raspberries which abounded, ~~though we~~ ^{therefore} found that the Bears had been there before us.

The whole country being so well drained there is scarcely any land permanently marshy. At the heads of streams and springs there are sometimes small lakes or swamps, often due to the obstruction formed by the Beaver-dams.

In the lower part of the Valley region all the rivers connected with the Columbia and Chehalis overflow their banks during the summer floods to some extent.

This appears to be partly the effect of the retardation of those rivers by their passage through the Coast Range. It is not however a very serious objection to the cultivation of the river banks, as it is found that most crops produce quite as well, when sown in the ground after the flood subsides in July, and in most years all danger is over before this time.

Along the coast the mouths of rivers are also bordered by brackish marshes, which are covered with a thick growth of the finest grass, and are capable of producing on their higher parts good crops of vegetables. Even Wheat has been successfully raised on them. ^{and the growth of these forests deep.}

~~Just within the range of the coast there is a line of swamps producing the usual vegetation of the Cranberry marshes throughout northern America, most of the plants being the same as are found ^{there} associated on the Eastern coast.~~ Such swamps also occur about Puget Sound and on the cold mountain summits.

The characteristic clearness of the water found in all mountain streams is almost universal in this Territory.

During the summer floods the rivers become turbid, and for a short time after heavy winter rains, but I know of only one stream ^{on this side of the Cascades,} which is constantly dark colored.

A This is Black River a branch of the Chehalis, flowing southward through a very level tract along the eastern base of the Coast range. The slight fall of the ground and the obstruction it meets in entering the Chehalis nearly at a right angle, causes this stream to overflow an extensive tract known as the Black swamps, and the water is throughout of a very dark color from decomposing vegetation. Some of the best land in the Territory lies adjoining this river, and doubtless many peculiar animals and plants are found around it, there being no similar swamps that I know of in the Territory.

Fort Prairie (so called probably from a Canadian translation of the Indian name of the Oak, which we first met with here) is one of the most charming of the many ~~which we meet~~ like Oases in this ~~desert~~ of forest. It is nearly oval, about $2\frac{1}{2}$ miles long by $\frac{1}{2}$ wide the surface gently undulating in long thread-like slopes. In the centre stands a conical mound about fifty feet high, as if built by ancient inhabitants on purpose for a lookout place. Here the settlers true to American principles already talk of building a Schoolhouse. The fine fields of grain just ripe, the comfortable houses, numerous cattle and all the accompaniments of rural life, gave it an air of comfort and independent comfort nowhere to be excelled.

And the surrounding scenery is very beautiful. The highest points of the Coast Range bounding it on the west and the Cascade Mountains in view towards the east. A stream navigable for canoes runs on each side, and springs of the finest water rise in many parts of the Prairie.

On the next morning, the 24th we parted from our kind entertainers, and separated, some returning across the Coast Range, some going towards the Reedy, while Capt. P. and myself continued on the way to Olympia.

Following the trail down the river we had to make it seven times, once up to our waist in water, but the warm air made this rather pleasant, and we did not take off our clothes.

In this distance of about ten miles we passed through eight more fine prairies, mostly unoccupied, but on one of the finest obtained an excellent dinner at the house of a settler who had been there five years. This prairie is quite high and rolling, but some of the others are overflowed in winter by the back water of the Chehalis.

About 4 P. M. we reached the main road to Olympia, and about three miles further stopped for the night at a sort of public house.

I found that Steilacoom was a much better place for collecting specimens of all kinds except sea birds many of which though common at S. W. Bay rarely visit the upper part of the Sound.

The Coast Range from the Columbia River north to the Chehalis does not rise more than probably 2000 ft. above the sea. Beyond that river, the large Peninsula between the Sound and the Ocean is apparently composed almost entirely of lofty and rugged mountains, of which the summits rise far above the line of perpetual snow, but without those symmetrical volcanic peaks so characteristic of the Cascade range. The whole of the shoreline north and west appears to be merely a narrow sand beach lying at the foot of these mountains.

Among them the Indians report a large lake to exist, but the streams flowing from them are all small in size.

With this short summary of the general form and Geological structure of the surface, ~~which now mention some of the most characteristic plants and animals~~, produced with flowing words and special notes on the plants collected most of which are long known to botanists. I will also here describe briefly ~~some of these forests~~ which form such a striking feature and such a valuable product of the ~~forests~~ of the territory. The Geographical limits of the animals being as far as known described in the notes on Specimens I will merely allude to them, when important in connection with the Forests and other natural regions here mentioned.

The country neighboring to the lower Columbia has been celebrated ever since its discovery for its gigantic forests. Almost all the species of trees seem to partake of the enormous growth; but for the purpose of comparison with those of the Atlantic Border, ~~only one species is, ^{particularly} suited, all the others being distinct.~~

This tree the Hemlock Spruce⁽¹⁾ is I believe universally admitted to be identical with that ~~found~~ throughout Canada, the Northern and middle States —

~~It has perhaps, as great differences as many other plants some of which have been until lately considered as varieties, and others, on the contrary which were at first called distinct species but have since been reduced to the rank of varieties. Its chief difference is in its size which as if to rival the more peculiar trees of the country, becomes at least twice as great as it is in New York State —~~ Pemmianum according to Michx.
(1) *Abies Canadensis* Mill. (Carr)

On the 25th we walked all day along the public road passing through prairie a great part of the distance; similar to all the rest about Puget Sound, being gravelly or sandy, very dry and with a thin growth of grass. Some of the crops of wheat and rye were however among the best I ever saw. We travelled about twenty miles, and by night our feet were so sore and the heat had so much effect after our late rough journey, that we were glad to stop seven miles from Olympia, at the house of a Puget farmer who had been here many years and ~~had~~ succeeded as well as most white settlers beginning as he did with nothing.

His well kept fields, good crops and large number of cattle showed that he had done well; and his good face made us feel quite refreshed.

We had to ride the last seven miles, as our feet were so swollen that we could not get our boots on. Reaching Olympia on the morning of the 28th I remained there a day and then went on to Steilacoom. I will omit here the observations made at that visit to the Sound, as I intend to embody them in a more complete account of that region.

I remained at Steilacoom about a month making collections, which I left in charge of Dr. Shuckley. July and August were quite warm, the thermometer rising to 88° on one day, and there was little rain, though a slight shower fell July 16th and a heavy rain about the fifth of August with thunder which is rare in any part of the territory.

Aug 21st I left Fort Steilacoom and returned to Olympia. The next day I rode about twenty miles towards the Lewis & the day following the remaining forty miles arriving at the landing just at dark. After passing the very low ridge between the upper Chehalis and Lewis, the gravelly level prairies are changed for others more rolling and richer. Those forming the Lewis farm are very extensive and beautiful, and among the best in the territory. The Lewis itself is a very rapid stream hardly navigable for anything but canoes more than two miles from its mouth. At that time the summer flood was just beginning to subside and the water ran of a bluish white color, probably from passing over beds of clay. * The & I also found much interest and advantage in comparing our notes & specimens, which had been quite different during the last six months. W. to go. 23rd

Hemlock trees six or eight feet in diameter are not uncommon near the coast and they grow 150 feet high, half of which dimensions only are attributed to the Hemlock by Michaux in his *Sylva*.

to
p
24
A I have been inclined to believe that the long growing season has much to do with the size of trees on the western coast. The constant rains and mild winters must make a great difference in this respect. The rarity of lightning below the mountain summits also allows them to grow higher as suggested by Dr. Torrey. Storms of thunder and lightning are almost unknown in the valleys though often to be seen about the high peaks. The Hemlock grows in these forests from near the elevation of 5000 ft. on the mountains, to the sea. It is scattered along river banks and damp places nowhere forming forests by itself, but most abundant west of the Coast Range.

The tree most abundant and characteristic of the forests is that of which different varieties are known in the country as the "Red" and "Black Fir." (1)

(This tree has foliage somewhat like that of the White Spruce of Canada but the leaves are larger and longer.

The cone is also very different from any other species. Its trunk is straight and commonly without branches for fifty feet or more, the bark resembling in color and the coarseness of its furrows that of the Chestnut. Its wood is rather coarse grained and liable to warp, but is more used for lumber than any other kind, being abundant in almost all parts of the forest country.

^{the} This forms the principal part of all the forest growth of the drier Valley slopes, from about 5000 ft. elevation down, but is scarcer in the moist soil of the Coast Range and not found on inundated River banks.

(The tree known as "Yellow Fir," (2) is a much finer looking tree and grows higher but the branches are very short, so that its top has a long cylindrical appearance. The foliage is denser than that of the preceding and darker hue. It grows only along river banks, in sandy soil, close to the limit of inundation, and does not extend high up the mountains west of the Coast Range.

(1) *Abies Douglassii*, Sabine. (2) *A. grandis*, Lindley.

It is excellent firewood even when green and the bark of the dead trees is often so full of resin as to burn like a torch, and is commonly called "Grease-wood". This is the reason why such extensive tracts of this forest burn every year, while those near the coast, will only burn for small distances at a time.

Its banks are lined by immense trees of the "Yellow Fir" so much higher than most of the other species, and which I had not seen since leaving the Columbia last -

It took our ^{nearly} canoe all day to descend the bowitz and at its mouth I found a steamboat which carried me across the Columbia to the town of Rainier -

The very rapid current and numerous rapids made all the skill of our boatmen necessary, and here was shown the superiority of the white race even in the Indians own canoe to which he is here almost an appendage. Several times they required the sternest authority of our fearless captain to prevent them from carelessly allowing the boat to capsize -

On the 25th I left Rainier in a whaleboat, and descended the Columbia to Bakers Bay, which we reached on the morning of the 27th

We had rainy and squally weather all the way, and made slow progress, as there were but three men to row, and the boat was heavily loaded -

As I have before described the general features of this river, I here omit further notes -

I was detained on the Passage by heavy rain one day, then crossed to Shwawater Bay, and on the 29th went down to my former residence at Capt. R's. ~~at~~ thick fog and a strong north wind delayed us some hours and we did not arrive until 8 P.M. - I was glad however to get back to the bay, with its lively appearance from the multitudes of Ducks, Gadwits, Grebes, and Sand-pipers which even then began to return from their northern summer resorts - The large number of boats and Oyster vessels ^{ploughed ploughs} and the evidently increasing prosperity was striking even after so short an absence in the agricultural districts -

I now began again to collect specimens with renewed interest and obtained during the fall several interesting birds etc. *

[13½] Rains began to become more frequent and scarcely a week passed without a shower, as ^{had been} ~~is commonly~~ the case here throughout the year -

(*Trag. palustris* *Centurus Americanus* *Sceloporus Californicus*?)

Centurus Ludovicianus *Corvus corax* *Sturnella*

Ludovicianus *Statore fuscus* *Sceloporus Wilsoni*

In Sept. *Larus Belcheri* Vigors? *Uria Townsendi* ^{now Sept.} *etc.*

Podiceps Calif. Cetus? and others besides some fish &c.

Sylvicola Auduboni *Larus* *Trichas* *Delafieldi* *Fringilla*

Cyanus *et* *Kanda alpestris*. *Itanus vociferus* *Picus* *etc.* ^{capillus}

Its wood is much finer grained but tougher and more elastic than the Fir, and it makes those enormous masts now exported from the territory to Asia, and even to England. Considerable timber is also made from it on the Columbia river. The cone of this tree is oval smooth and about ~~three~~ ^{two} inches long, without the peculiar bracts of the Fir cone. The bark is rather finely grooved and of a pale gray color.

(Probably the next in importance to this is that rather inappropriately called "Cedar" ⁽¹⁾ being more properly an "Arbo-vitae". This is one of the most immense of trees, being often from twelve to fifteen feet in diameter, but it does not equal the Spruces in height.

Its trunk is often straight and branchless for twenty feet or more but the top is so knotty as to be of little value. For lightness, easy working and durability, it exceeds any other tree but is deficient in strength and elasticity. It is used chiefly for shingles, sails, and fine inside finishing. A backwoodsman with his axe only, will often make out of one of these trees a comfortable house, in a few days, as he can split the wood into boards and beams of any required thickness and length, with the greatest ease. The Indians used this tree to make their celebrated ~~baggs~~ canoes out of, and also split it into boards for their houses long before an iron axe was known among them, by means of stone axes, fire and wedges of the Serapapple. The bark of this Cedar is very fibrous stripping into long tough ribands, of which the Indians make articles of dress, sacks, etc. It has been suggested that it would make good paper, but its light brown color might be hard to change.

I have seen trees of this species near the coast lying prostrate and with Spruces four feet in diameter growing upon them, though entirely above ground the wood, except where bored by some insect seemed as sound as ever. I would hardly dare to guess how long these logs had thus lain exposed to the action of the very damp climate, but judging from the usual allowance for the age of the spruces it must have been

(1) *Thuja gigantea* Nutt.

My favorite resort for shooting ~~while at this Bay~~ ^{after my return here} was Cape Shoalwater, ^{distant} about six miles from where I lived so that I could not always go when I wished. The strong seabreeze which blew every day after about nine o'clock, and was almost sure to come with the tide, made it rather difficult to get there in a skiff or canoe. As I often saw tracks of deer and mooses there I concluded to go over and stay all night or as to look for them. I did so ^{both in the afternoon and morning} ~~and~~ though I shot ^{many} ~~several~~ White-fronted Geese Ducks etc and was out both by moonlight and before sunrise I did not succeed in finding any larger game.

At night I roasted a fine Mallard before the fire and with a few additions brought from the house made a meal, such as those only can know who try "camping out." The night was threatening rain but ~~under my boat sail~~ I slept soundly till daylight.

This Cape, like the Peninsula opposite, is formed entirely of sand washed up and blown into irregular hills and parallel ridges. It produces a good growth of grass and many interesting plants peculiar to the seashore. Groves and groups of Spruce and Pine trees, of small size give it a warm and pleasant appearance, and it has always been the favorite resort of the coast Indians, for from its vicinity they can always obtain food ^{for themselves} and pasture for their horses. About here I obtained most of the peculiar plants collected at the Bay and many interesting birds which I met with nowhere else. But I made a point of going there at least once every fortnight and often remained several days.

I also took every opportunity of going to other parts of the bay and in fact scarcely remained a week together at the house, although storms and wind ^{prevented} me from going about as much as I wished. *

There was white frost first on the 7th of October and ^{the last 3 weeks} a great part of December was clear and frosty with N.E. wind, unusual at that season.

As late as the 21st I saw the large Salamander creeping about, showing the mildness of the air.

The last week of the year was a continual and severe storm, not cold but with violent wind from the S.W. and heavy rain. I have mentioned in my notes the occurrence of the snipe and a Warbler at that late time of the year.

v. p. 18½

Spec. Act. *Arvicola Townsendii* *Felis fasciatus*. *Podiceps*
California *Phalaris Townsendii* *Lar. Zonon* *Pic. Gairdneri*
 rect. p.

several hundred years.* On the salt meadows about Shoalwater Bay dead trees of this species are standing sometimes in groves, whose age it would be almost impossible to tell. They must have grown when the surface was above salt water mark, as they are still abundant along the fresh borders of the meadows, together with other trees. But a gradual sinking of the land, still going on, has caused the tide to overflow ^{them} and killed the forests of which these Cedars are the only remains. This wood is perfectly sound and so well seasoned as to be the very best of the kind. It is extensively used in that vicinity. Further observations ^{of these} will give very important geological information as to the rate at which the land is sinking or perhaps now rising, as has been alternately the case for centuries. This is ^{further} proved by the existence of alternate beds of shells and of trees lying as they were deposited in successive periods, in the high cliffs bordering Shoalwater Bay. The Cedar is most abundant on the Coast Range growing in damp grounds, and along rivers nearly to the top of the Cascade Range.

The "Oregon Yew" (1) much larger than that of Canada and closely resembling the Yew of Europe, grows in similar situations with the Cedar, down to the coast, but is also found near Puget's Sound in dry gravelly soil. It is a tree twenty-five feet high and about a foot in diameter. It has all the toughness for which Yew is celebrated and ~~was~~ formerly used by the Indians for bows. Its foliage much resembles that of the Hemlock but is larger and brighter and its red sweet berries at once distinguish it.

There is only one other Coniferous tree common to all the forests. This is a Pine (2) so much resembling the Scrub or Jersey Pine as to have been confounded with it. It grows only in dry sandy prairies in the valleys and along the edge of the coast where it forms groves parts of which are annually washed away by the high winter tides, and waves of the ocean. It grows about 40 ft. in height and two in diameter and is of little value. Its pale green foliage contrasts strongly with the dark color of the Spruce.

*The durability of the wood of another species (~~the~~ the White Cedar, (*Caryocarpus thuyoides*) of the New Jersey Cedar swamps is well known but there they are buried in that great preservative, Peat.

(1) *Taxus brevifolia* Nutt. (T. Oregonus in the plate) cont. of *Mechanic's Sylva Americana* (2) *Pinus contorta* Dougl.

1855 January began clear and cold and on the 2nd it snowed a little but a rain at night washed this away - On the night of the 5th it again snowed about six inches deep, which was followed by clear weather so cold that ice formed about the shores of the bay - The warm southerly winds returned however on the 9th and afterwards there was no more snow and little frost.

On the 14th it was so warm that a bat came out and flew about the house for some hours before dark.

On the 23^d I visited the Cape and for five days, spent my time in hunting for winter birds, etc - I obtained some interesting, ~~but not~~ ^{and} new specimens * A very large number of species remained about all winter, though I got few not before observed, some however new to the territory - To show the mildness of the season I make a quotation from my note for this time. v p 19 1/2

* This beautiful weather continued with little interruption until February 1st when it stormed again and continued rainy until the 14th Then another mild clear time followed by colder weather, ice forming & in. thick on once or two nights. But on the

"25th Saw *Cardosmia palmata* in flower, and also *Rubus spectabilis* and *Trillium grandiflorum*!"

23^d I left the Bay as I then thought for the last time, intending to attend the Indian council to be held by the Governor on the Chehalis, and hoping to be able to get a place as Surgeon in his expedition to the Blackfoot country in the summer, thence to go on to the Atlantic states - With Mr. Tappan, Indian Subagent, ~~and some residents of the~~ ^{and Mr. Searson, the Inspector of the property} Bay, besides several Indians, I crossed the Bay about sunset and slept that night in the house of a farmer near the Cape. Next morning we walked up the seaboard to the Chehalis a distance of twenty miles, & arrived there at 5 1/2 P.M. As soon as we had eaten and collected our party we again started in canoes up the river and after paddling about ^{eight} ~~four~~ miles against an ebb tide encamped for the night on the river bank.

A fresh and exhilarating N.W. breeze blew all day and the sky was perfectly clear. The snow the sandy beach nearly to the water side at low tide and hard enough for us to go on made the walk very pleasant.

* *Trichilutes lagopus* *Am. etc.* *Picus ruber* *Lucas ?*
Linaria pinn. *In low.* *Platanus racemosa* *Chusquea*
Margarita alba ? *Phalaropus hyperboreus* *Thryothorus borealis*
Diomedea brachyura *In Jan'y.* *Harporhynchus glacialis*
Pluvialis Helueticus *Buteo hymenalis ?* *Oedipoda occidentalis*
in deer *Linaria minor*

The characteristic tree of the Coast Region is the "Black Spruce" (1) before referred to as covering the islands in the Columbia after passing the gap of the Coast Range. Its limitation to the Coast Region is very marked, and it begins to appear immediately on passing through that range along the rivers as over its summit.

On the Chichelis River the first trees of the kind seen are just where that river gets fairly among the mountains, where there are two or three gigantic specimens which look old enough to have been the parents of all the rest, but not one is found east of them —

This spruce has a diameter of eight or ten feet, but is not so lofty as the Fir, which in the forests covering the hillsides about Shoahwater Bay, may be easily distinguished by its overtopping the Spruce —

Its bark is thin scaly and dark reddish, somewhat like that of the Wild cherry (*Prunus serotina*). It commonly branches within thirty feet of the ground, and its top and foliage are very dense, more so than any other except perhaps the Balsam Spruce —

The leaves growing in several series entirely around the twigs are dark green above but glaucous beneath, which when the wind blows gives this tree a bluish appearance.

The cones growing near the summit, are when young bright purplish red and very ornamental. The wood is very tough, and when not knotty makes good lumber and masts, but does not burn well, except the young branches which are very resinous —

The long fibrous roots are used by the Indians to make very strong baskets and bags — This Spruce grows down to the very edge of salt water and even on the brackish marshes which border the Columbia, and Chichelis Rivers. A very moist climate seems essential to its growth — About Puget Sound, though that is an arm of the sea it does not appear until we reach the Straits of De Fuca where, along the high shores of Whittys Island a few trees are found and it is said to be abundant about Bellingham Bay and the rivers ^{further} ~~near~~ ~~forth~~ —

(1) *Abies Menziesii*. Transbert.

+ Besides those mentioned I saw *Haliaeetus leuccephalus* *Corvus Hudsonius* *Setor boopis* *A. fusces* *Bubo Virginianus* *Otus palmatus* *Buteo borealis* *Certhia ~~Americana~~* *Trogl. Bannickii* *Parus rufescens* *Regulus satrapa* *P. calendula* *Turdus migrat.* *T. morinus* *T.* ? *Empidonax* *Arizona* *over.*

Besides the six Coniferous trees common to all these western forests and the Black spruce peculiar to the east Region there are a few scattered trees of three other species which I will briefly mention.

The "White Spruce" ⁽¹⁾ which ~~appears to be the same tree~~ ^{is very different from the tree} found throughout ~~the Northwest~~ ^{the Northwest states}, occurs in small numbers about Puget Sound and on the mountains but becomes scarce near the Columbia River. Its smooth white bark, dark green shining leaves and very symmetrical branches arranged in whorls towards the summit, make it one of the most beautiful trees, but its wood is light brittle, and of little value. It does not exceed sixty feet in height and two in diameter.

A few trees of a Pine ~~are~~ found near Steel's coon which resembles ~~if not identical with~~ the "Red Pine" ⁽²⁾ of the Atlantic states. It grows fifty feet high and has a rough bark and an open scraggy head.

The "White Pine" probably the species or variety before referred to so found on the Cascade Mountain ⁽³⁾ is said to be abundant on the Olympic mountains and along the west side of Hood's Canal.

A Juniper of an uncertain species, but probably the same seen at Fort Colville, was seen by Mr Gibbs "in the swamps at the mouth of the Snohomish River".

Another species of *Arbovitae* ⁽⁴⁾ is described by Nuttall as found on the Islands north of Cape Flattery, and probably extends into the territory. The Cedars growing on Whittier's Island resemble it in their smaller size and ~~its~~ ^{its} denser branches, but I have never examined as to other characters.

Forests almost exclusively composed of trees of the family would hardly be expected to produce many deciduous trees, and such is the case. There are however some which from their value as timber, and their other interesting properties deserve more than a passing notice. It may be stated of them generally that they are found only on the borders of prairie, or the banks of rivers, and that some are limited to each of the principal Regions here described.

- (1) *A. alba* ^{*Prachiana*} ~~Tab.~~ (2) *P. resinosa* Lb. (3) *P. Strobus* var. *montana* (Cora. Pg.)
 (4) *Thuja plicata* Nutt.?

Larix occid. *L. laricina* *L. laricina*?
Juniperus communis — ? *Ardea* *Floridiana* *Scolopax* *Wilsoni*
Amex *Flutmaria* & *Lycopodium*. *Stras* *Bachas*, *acuta*, *claytonia* *Trilob.*
Valeriana *marila*, *fusca*, *americana*, *parvifolia*, *glacialis* *Myrica*
caullata *americana*, *diversa*? *Phalaris* *Townsendii*

The treaty was held on the grounds of a Mr Pelkington one of the few pioneers who had yet ventured on this river. He had selected a beautiful site at ~~a~~ bend of the river, but in order to build above all danger from floods had been obliged to clear off a piece of the most gigantic growth of forest. The richness of the soil repaid him, for this labor while he had in the neighboring meadows a splendid grass-land.

During the four days we remained here the weather was moderate, and there was some very heavy rain. A slight shower of snow fell which soon melted off.

Of the treaty it is not my province to speak, but I may give some remarks on the Indians, as bordering on the province of Natural History.

Tribes from nearly all the branches of the race living west of the mountains were present, including the upper and lower Khehalis, Inimaut, and others towards Cape Flattery, with the few remnants of the Cowitz, Chinook and Willapa tribes. There being, as appears by the able Ethnological researches of Mr Gibbs nearly all of different origin, their languages entirely dissimilar, and their antipathies deeply rooted, it was found impossible to combine them on one or two reservations.

Though perfectly friendly to all appearances while here and engaged every day in their games together, it only needed the potent influence of "Firewater" to awaken smothered feuds, and they would no doubt gladly have exterminated each other in advance of their almost certain doom.

Physically there is little perceptible difference: the tribes most remote from the whites being however more finely developed, and as a general thing those of the mountains being superior to those of the coast. But from the neighborhood of Cape Flattery many show the light hair and features, and superior intelligence of the northern tribes and are supposed to be somewhat intermingled with Asiatic races.

I noticed one young man among the Khehalis who would have been a model of Indian manly beauty, having the characteristic features, fully marked and well proportioned. Most however, have, large mouths, small eyes, flattened noses or some other disproportioned features, and all more or less deformed heads, from their custom of flattening -

Commencing with those common to both regions, we have first and most important two species of Maples. The "White Maple" ⁽¹⁾ (quite different from the species called so in the Atlantic States), is the most beautiful of all the North American Maples. It is frequently 80 feet in height and sometimes six in diameter, its bark smooth and white, and its pale green leaves generally from eight to twelve inches in breadth. Its long racemes of yellow flowers come out among the young leaves in May and are very ornamental. The wood is superior to that of the Quaked Sugar Maple in the beauty and variety of its veining, and is capable of a high polish. Sugar has been made from its sap at the Cascades and may yet become an important product. This Maple grows from the higher parts of the mountains down to the coast principally on river banks and in moist or springy grounds in the forests.

The "Vine Maple" ⁽²⁾ so called from its prostrate and spreading growth, by which it forms almost impenetrable thickets, abounds in damp parts of the forests.

It grows only 20 or 30 ft. in height with a thickness of about a foot, and is of little value except for firewood.

The naturally bent pieces are often used for bent timbers, and the wood is very tough, soft, and white.

Its small and elegant leaves are the only kind that turn scarlet in autumn, and its rich purple flowers are very beautiful in April.

* The "Oregon Alder" ⁽³⁾ also extends throughout the forests, but is most abundant and luxuriant along the coast where its bright foliage and white bark are a great relief to the eye in contrast with the almost universal darkness of the Spruces.

It grows sixty feet high, has ~~very~~ white soft wood well adapted for furniture carvings etc. In the dry parts of the Valley region it is a rare tree.

Another smaller kind of Alder ⁽⁴⁾, merely a large shrub, grows in small numbers in scattered localities near the Columbia River at Oak Point and near Fort Steilacoom.

(1) *Acer macrophyllum* Pursh "Large-leaved Maple"

(2) *A. circinatum* Pursh. (3) *Alnus Oregonus* Nutt.

(4) *Alnus* ~~*rubra* Bongard~~ *viridis* DC. (*rubra* Bong?)

* The Smooth Maple (*A. glabra* Torr.) is very rare west of the mountains and not common anywhere I have been, probably a tree of the Rocky Mountain group.

These Indians have not that reserved and sullen gravity attributed to the race and which is more apparent among those east of the Cascade Mountains —

They are full of jokes and laughter, when not bowed down by hardships or maddened by drink — See their own houses, good feeding, hospitality, and content are apparent when visited by the white man, who unfortunately has been the means of degrading instead of improving them —

The men employ themselves in fishing, hunting, making canoes or houses, but disdain the labors of the field, which commonly is performed by the women or slaves if they have any — Potatoes are generally their only crop, and they succeed well with them —

The women also supply fuel, and attend to the household duties, and the sick cladics, may be seen working at their articles of dress and ornament with the same industry as their white and more refined sisters —

Between the hours of council, games, dances, and singing enlivened the camp. Their songs, in a minor key are very simple, but wild and often very impressive —

March 3^d The council dissolved and this morning all are preparing to go. I accompanied the Governor's party up the river, making slow progress, as the river was very high and the tide did not favor us far —

About dark we arrived at the first rapids considered about 45 miles from the sea, and the head of tide-water and steamboat navigation. At present the floods make the water nearly fresh even at Palkington, but the brackish marshes continuing up even to here, show that it is somewhat salt at other seasons —

I noticed the first Cottonwood about ten miles below and Alder is becoming less common — Two ^{large} considerable branches come in from the north, viz the Wynush and Setaup, both of which are said to have considerable prairie on them, and from them prairies extend up the Chehalis on both sides, most of which are known however only to the Indians —

I saw few birds or other animals, some Gulls and ducks, principally the Goldeneye and Buffed Head — a few Sheldrakes, Brown Jays and Robins —

Deer and Elk are doubtless common but we could get none. In the mountains northward, I was told of an animal being found which seemed from description to be the Moose —

The Oak ⁽¹⁾ before mentioned as found east of the Cascade Mountains is common throughout the Valley region, but very strictly limited westward by the Coast Range. On the Columbia river Oak Point is the first place where they are found in ascending it, and on the Chehalis, the last I saw in descending in July 1855 were on small prairies close to where the first Black spruces occur, near the mouth of Black River, where they are stunted and sickly, covered with long moss, as if the air ^{and soil} ~~was~~ too moist for them, which is probably the cause of their limitation. This Oak is the hardest wood in the territory and ~~very~~ ^{much} ~~more~~ ^{the most} important.

It grows only on the borders of dry gravelly prairies.*

The "Oregon Dogwood" ⁽²⁾ is ~~very~~ ^{strictly} limited to the Valley region where it grows most abundant near the Columbia, and becomes rare ~~west of~~ ^{north of} Fort Steilacoom.

It closely resembles the Dogwood of the Atlantic states but is about twice as large in all its parts. Its great toughness and strength make it useful and its white flowers six inches in breadth are among the most beautiful ornaments of the forest in April.

On the same range, but common as far as the Straits of De Fuca, grows the beautiful *Arbutus*, ⁽³⁾ sometimes called "Laurel" in the territory. Its smooth reddish bark and shining evergreen leaves give it quite a tropical appearance, and it is ~~one of the few trees~~ ^{one of the few trees} ~~seen~~ ^{seen} ~~in the territory~~ ^{in the territory}, I have met with extending from here to San Francisco.

The wood is so heavy as to be used by the Indians to make anchors, by binding the branches around stones. It grows only on dry gravelly banks, ~~and~~ ^{up to a} ~~sometimes~~ ^{height of} forty feet high.

The "Oregon Ash" ⁽⁴⁾ grows in moist sandy soil along the banks of rivers and lakes throughout the Valley region, and a few small trees are found along the Columbia down to its mouth, but none along the rivers arising west of the Coast Range.

It much resembles the Eastern White Ash but is much larger in growth. The wood has all the toughness, elasticity and lightness for which that tree is celebrated, and is of course valuable for many purposes.

(1) *Quercus Garryana* Douglas. (2) *Cornus Nuttallii* Andab. (3) *A. Menziesii* Lambert. (4) *Fraxinus Oregonus* Nuttall.

* Its shape is generally similar to the Apple tree but is dark ~~shady~~ ^{on prairies} woods it is sometimes found growing tall & straight, like the oaks in our Eastern forests.

The next two days we paddled slowly up against a violent current crossing several bad rapids on the way, and having a constant and heavy rain to add to our troubles - We encamped the first night near a sawmill, the second in a dark Fir forest, among the highest hills of the Coast Range.

The river banks are much changed in appearance above the tidewater, ~~stik~~ trees becoming common, a little further up, the Yellow Fir, and on prairies near our last camp are the first Oaks. One prairie we passed through was about two miles long, beautifully undulating, ~~green~~ but the soil gravelly, approaching ~~the~~ soil of those higher up which I visited last summer. The low grounds near the water are covered with a dense almost impenetrable growth of shrubs, principally Cornus, Willow and several others hereafter ^{to be} more particularly mentioned.

Mich. 6th About noon we reached the end of our weary journey at Grand Mound Prairie, where we were to take horses for Olympia. It gradually ceased raining, and the appearance of the country became pleasanter.

The prairie was already green and flowers began to appear on it. I had noticed in the woods the yellow violet and a toothwort. Bluebirds though silent looked familiar, and Meadow larks were beginning to sing.

The next morning we rode 26 miles to Olympia.

I remained there five days making arrangements for going Eastward and examining all the books in the library, likely to contain information on the country and its productions. Finding that there would be time for me to make an excursion down the sounds, which I was very anxious to do, I left Olympia on the 19th in a ~~salmon~~ with Secretary Macsen and Lieut. Arnold, and arrived at Steilacoom 25 miles distant in about 5½ hours.

I noticed some birds which I had not seen at Shoalwater Bay at any season, and near Olympia were great flocks of the three species of black Surf-duck, and others.

~~The largest Gulls were however scarce.~~

The weather had been lately equally cold and unpleasant, but flowers continued to appear among which I noticed the Strawberry and Red flowering currant.

* This is about 100 miles from the sea, following the meanders of the river though only 50 in a direct line.

* *V. glabella* *Dentaria tenella* -

+ *Mergulus alle L.* *Uria Grylle L.*

+ *Fragaria vesca L.* *Ribes sanguineum*

Two species of *Poplar* form the principal forest growth along the river banks, ^{partly} so low that they are overflowed in summer. Both have an extensive range being found throughout the ^{shores of the} Columbia and its branches, and also east of the Rocky Mountains on branches of the trifork etc. These are the cottonwood, (1) a tree sixty feet or more in height and two or three in diameter, of very little value as timber; and the "Balsam Poplar" (2) so called in the territory) or "narrow leaved Poplars" of larger size but not more valuable ~~than~~ ^{than} ~~the~~ ^{the} ~~former~~ ^{former}.

These trees cover the islands and low shores of the ~~branches~~ ^{river}, from the Coast Range up to the height of 5000 feet in the mountains - but do not grow where salt water overflows the banks -

Another *Poplar* (3) also common across the whole northern parts of the continent is found high on the mountains and near Puget Sound extends downward to the level of the sea - I also saw it common east of the Cascade Range especially near Fort Colville, but I have never seen it near the coast -

Nearer the *Poplars* but nearer the water grows several small species of willow only one of which can be called a tree, and is remarkable for its large leaves (4) This is the same found eastward to Walla Walla where I have mentioned it as the largest tree found.

Another species (5) with large oval leaves, grows along the coast to the height of twenty feet, but is useless. It is the first plant I have seen in flower, blossoming as early as ~~March~~ ^{February} at the mouth of the Columbia.

The willows on river banks support the sandy soil by their roots while their stems growing very densely, catch a great deal of drifting matter and thus increase the height and extent of the shore until *Poplars* can grow on them.

One shrubby species (6) growing on the dry hill sides of the Cascade range is remarkable for its leaves which unlike other willows are very small, oval and shining, somewhat resembling those of the "Checkerberry". Its bright yellow branches add to the ornamental appearance of this shrub -

(1) *Populus angulata* Willd. *P. angustifolia*, Torrey

(3) *P. tremuloides* Michx. "The American Aspen" -

(4) *Salix speciosa* Nutt. - (5) *Scouleriana* Benth -

(6) *S. lutea*

I had to wait one day at Steilacoom for want of conveyance, and then started on board of a small sailboat, with a strong S.E. breeze. But about noon this suddenly changed to a severe northerly squall with round lumps of snow falling thickly for a short time, then changing to rain with which we reached Segettel, 40 miles, about 9 $\frac{1}{2}$ P.M.

15th I was again detained all day by a calm. This town is ~~an~~ excellent site, and is prospering. The Duwamish emptying about three miles south is said to ~~possess~~ ^{have} mines of good coal and much farming land on its banks.

Above here navigation is difficult for sailing vessels from the narrowness of the inlets and the uncertainty of the wind. The view here of the ~~coast~~ ^{glacier} range is fine, but their rugged snowy ridges are not so beautiful as the conical peak of the Cascade Range.

While here I shot some specimens of two rare Grebes as described in my notes —

March 16th There was heavy white frost the last two nights but this morning is much milder with a light breeze from the S.E. Left Segettel about 9 A.M. and at once a fresh cold N.E. breeze sprang up with which we beat rapidly down as long as the tide continued to ebb. Passed several sandy cliffs and gravelly points the country generally similar to that above. The Sound begins to widen and many fine views burst successively on the sight, while the air is perfectly clear and pleasant. The long level lines of cliffs bordering the shores and crowned with dark green forest are varied by numerous bays, and points, while the snowy mountain rise far above them on either side —

Having made about fifteen miles only we anchored sometime after dark near Fourweather Bluff, the tide having turned and the wind dying away as it usually does here after sunset in clear weather —

March 17th Another white frost last night and this morning is clear mild, with only a faint northerly breeze blowing, so that we merely drifted down with the ebb tide and when it turned were obliged to anchor at the entrance of Hood's Canal. Scarcely any birds were to be seen on the Sound, most of them taking advantage of this calm to go to the Straits and Uccas —

Pairs of Sea doves (P), rarely or never on Grabe alone seen —

Mergulus alle.

Three other small trees growing in damp open grounds throughout these forests will complete the list. The "Wild cherry,"⁽¹⁾ grows to the height of thirty feet and in appearance closely resembles the common cultivated cherry tree. Its fruit is small black and bitter, and its ~~trunk~~ ^{trunk} too small to be of much use. It can be used for grafting better kinds on.

The "Oregon leaf apple"⁽²⁾ sometimes grows twenty feet high and one in diameter, but generally forms low tangled thickets, at the coast equalling the famed "Mangroves" ^{of the bays} in impenetrability. Its wood is hard, tough, and used for wedges etc. The fruit though small is abundant and well flavored. - ripe in October -

At Astoria very fine apples have been raised from grafts on this tree.

The "Oregon Buckthorn"⁽³⁾ (one of the three plants called "Bear-berry" in the Territory), grows on mountain sides and open ravines, to the height of thirty feet but is less than one foot in thickness and of the use of no value. The berries are eaten by Bears very greedily but the Indians do not use them.

* A description of these great forests would be incomplete without some mention of the numerous shrubs which make them almost impenetrable in places and many of which are useful either for their fruit or some ~~mechanical~~ ^{other} qualities. They are also very much limited in range by the boundaries of the two Regions described and thus become very characteristic of these Regions.

Nearly all I believe commence on the high slopes of the Cascade Range, but while some extend east of them, most are peculiar to their western side.

Others extend westward only to the Coast Range and many which flourish in the high moist climate of the mountains, become rare or stunted in the Valley Region, and are again found still more luxuriant in the rainy Coast Region, where they are the characteristic species. These circumstances divide them into groups which I shall follow in describing them and their distribution.

(1) *Cerasus mollis* Douglas (2) *Pyrus rivularis* Douglas

(3) *Frangula Purshiana* (D.C.)

* To call forests of such variety by the general name of "Pine," as is often carelessly done by travellers, gives a very incorrect idea of them to the inhabitants of the eastern states and Spruce would be a much preferable term.

I went ashore and walked for some miles around the point. The hard gravelly beach which borders the sound almost everywhere, and slopes steeply into deep water, is very pleasant to walk on. In lagoons formed within this in some places, and containing brackish water I found ~~some~~ flocks of the freshwater ducks such as Mallards, Teal, Buffle-Head, and Golden Eyes, and shot some for our breakfast. In a salt marsh a small flock of Redwings, rarely seen near the coast ^{were singing their} ~~family + pleasing melody~~. I found however no other birds, but picked off the rocks some shells not before seen which I found afterwards more abundantly.

The cliffs here are more sandy than those above but the forest covering them consists still of the Red Fir, with the usual underbrush accompanying it.

About 1 P.M. the wind having increased we again sailed northward but about 10 P.M. had made only about 9 miles and had to anchor again for the night.

We passed some large rocks in Port Townsend, which are a favorite resort of Cormorants, large numbers of them then being about, but I could not approach near enough to find out whether they were of more than the usual black species (1) and they were very shy.

About 8 o'clock next morning taking advantage of the tide we reached Port Townsend only eight miles distant. After breakfast I walked out with my gun and was much surprised and pleased by the appearance of the country and the great numbers of birds I found there. It seemed to be a kind of a stopping place for species migrating northward, and even ^{some of the} tender summer insectivores had already arrived at this extreme northern corner of the territory. I saw a Quail flying high in the air and Audubon's Warbler was abundant in the trees. Great numbers of winter residents were also about and altogether I saw more species at a time than at any other point in the territory.

The marshes and ponds near by were alive with water fowls and great flocks of Geese were feeding on the prairies.

+ A Humming bird had even appeared among the beautiful blossoms of the Red flowering currant, & I saw a pair of Pigeons.

I was however entirely disappointed in finding any of the more northern birds which I had hoped at this early season (1) P. Townsendi (bird) would be still within the Territory.

Cascade

I have observed but few shrubs each side of the mountain ~~range~~ ^{which extend eastward to the Rocky Mountains range.} These are a Hawthorn, (1) and a shrub rather absurdly called "Oregon Grape," more properly a *Berberis*, which is very widely distributed over the western mountains, and now often cultivated in the East. This is a very ornamental shrub with leaves like a Holly and blue berries which are eaten and preserved. Its yellow fragrant flowers open in March — Neither of these extends west of the Coast Range.

The ~~American~~ American Hazel (2), is common in the dry Fir forests of the Valley and ~~seems to extend~~ ^{extends} across the continent westward, though I did not observe it near Fort Babine. Its fruit is larger than Eastern. Three species of *Spirea* grow with this most of the under brush of the Fir forests. A large *Ceanothus* (3) is also common as well as a Mock Orange, (4) both on the edges of prairies, and are all rare or wanting in the Coast Region. Two species of *Raspberries* (5) also prefer these dry forests though also found to the Coast, both resembling kinds found on the Eastern coast —

Two others are found in damp ground along rivers, and are much finer near the coast. One of these the *Sambucus* berry (6) called from its resemblance in color to the ~~color~~ ^{color} of the *Sambucus*, is one of the most delicious fruits I ever saw, and is a great article of food with the Indians. The fruit is ripe in July; in April the fine purple blossoms are expanded. It would probably not grow well in the cold dry climate of the Atlantic coast.

A fine large *Gooseberry* grows near the Upper Chukchi which I have not seen described. It is now cultivated in the territory by Mr Gibbs & others —

On Whittys Island, which is in the Valley Region and resembles it in its forests, I found two shrubs, interesting as showing their western limits, both being common across the Continent throughout the Canadian Province. (10)

(10) *Rhododendron maximum* Willd. *Shepherdia Canadensis*, (Nutt)

(8) *R. spectabilis* Pursh. the other *R. macrophyllum* Dougl.

(7) *Rubus Nutkanus* Moench. *R. leucodermis* Dougl.

(5) *C. Oreganus* Nutt. (6) *Philadelphus Gordonianus* Tindl.

(1) *Crataegus sanguinea* Pallas. Probably distinct from the Siberian plant. It bears black fruit —

(2) *Berberis Aquifolium* Pursh. *B. pinnata* Pursh, seems confined to the western mountains, and closely resembles the other, but is more shrubby — (3) *Corylus Americana*, (Walt.)

(4) *S. Opulifolia* Linn. *S. Arisaeifolia* Sm. *S. Douglassii* Hooker

The site of this town is the most beautiful I saw in the territory. There is a fine sandy beach forming a curve which faces the southeast, and with a level prairie extending back from it a little above high-water and large enough to build a city upon. Behind this rises a grassy slope about fifty feet high, which then becomes a beautiful rolling prairie, with very rich soil, and running back in various branches among the forest for many miles, diversified by groves of Fir and other trees in the most Parklike manner. Such a place had of course soon attracted attention and all the best claims were already occupied.

The day was delightfully warm and I thought I had never before seen so pleasing a country.

The calm deep harbor in front of the town, and protected by high land on three sides, open only toward the East, seemed particularly made for the site of a great commercial city. And only six miles distant is the still better harbor of Port Discovery, facing the north, and an excellent ^{other} refuge for vessels going in or out of the Straits in stormy weather.

I regretted that my time and means did not allow me to visit it.

I noticed here the entire absence of the Oak as on the prairies near the coast. Many beautiful flowers decked the prairie and others were blooming in the woods.

On the 20th I crossed the Sound here five miles wide to Whitty's Island, in company with an Indian chief, and his family who were going that way. I noticed in crossing a curious Ark not seen elsewhere but which is said to be common in the Straits of Fuca (1)

Landing I immediately crossed the island three miles wide to Penns Cove where I had been recommended to stay awhile, as a good place for collecting.

~~As this island has the reputation~~ about the Sound of being the Garden of the territory I felt much interested in examining it and being also at the head of the Straits I hoped to find some specimens new to me.

I was not disappointed in the Island which contains prairies of the richest kind over nearly half of its surface, not supposing however to many near the coast and on rivers running into the Sound.

~~Many~~ The shrubs more characteristic of the Coast Region but which are also found to some extent in the Valley are ~~amongst them~~ evergreen and very beautiful.

The dark Spruce forests are thus ornamented by a group of tropical luxuriance and beauty but of northern types. Except close to the coast they are more easily travelled through than those of the Valley region the shrubs being less dense and ~~thinner~~.

One of the most remarkable of these is called in the territory "Devils walking stick" ⁽¹⁾ and well deserves the name. I have seen it about 3000 ft. up the cascade mountains, but it is most abundant in springy grounds near the coast. Stems armed with long thorns and eight feet high rise from a subterranean creeping rootstock, branchless, ~~but~~ with a tuft of leaves at the summit shaped like a maple leaf but often two feet in breadth. It is almost impossible to get through a thicket of these without severe scratching, as a step on the prostrate stems is sure to set the branches swinging, ~~and~~ the wounds given are very painful.

The "Sallal berry" ⁽²⁾ is one of the most important to the Indians of the coast who dry large quantities of the fruit for winter stores. In the Valley Region this shrub is only a foot or two high, but on the coast, from four to eight feet. Its large, dark evergreen leaves and, ~~beautiful~~ rose colored flowers, blooming in May excel in beauty any other shrub found there. The fruit ripe in August resembles a fine Harweet apple in flavor, and is of the size of a small plum.

Three species of Huckleberry ⁽³⁾ have a similar range. One ⁽³⁾ bears black sweet fruit, and has flowers and fruit together even in January! its leaves are evergreen, ^{much resembling the Box.} Another ⁽⁴⁾ bears blue ~~large~~ and acid fruit. A third ⁽⁵⁾ is red, and very pleasant, acid, ripe in September. — A fourth ⁽⁶⁾ that ~~is~~ ^{is} more than a foot in height, is found in prairies of the mountain and Valley Region but not on the coast. It bears blue and agreeable fruit. Four species ⁽⁷⁾ of Gooseberry also grow near the coast but the fruit is small and ~~poor~~ ^{that of the last unattractive.}

The beautiful Red Flowering currant is most common in the Valley Region but also extends to the coast. ⁽⁷⁾

One shrub ⁽⁸⁾ of this family but bearing a dry capsule instead of a berry seems peculiar to the coast.

- (1) *Echinopanax horridum* Smith. (2) *Gaultheria Shallon* Pk.
 (3) *Vaccinium ovatum* Pursh (4) *V. parvifolium*.
 (5) *V. ovalifolium* (6) *V. cespitosum* Michx.
 (7) *Ribes divaricatum* Dougl. *R. laeustre* Poir. *R. laxiflorum* Psk.
R. bracteosum Dougl. (8) *Ribes sanguineum* Psk.
 (9) *Menziesia ferruginea*

It was estimated by Col. Ehey one of the first settlers there that over 6000 acres were already taken or claimed when five years ago there was not one white man. The forests are rather inferior in timber which is mostly of "Red Fir" though in the lower grounds ^{are} the Plumb, White Spruce, Cedar, and on the northern side a few of the Black Spruce so characteristic of the coast, but which does not extend far up the Sound.

A few oaks only occur on the Eastern part of the Island. The soil of the forests is gravelly and poorer than the prairies, and they are much disfigured in places by the fires so common in this kind of timber.

To describe the beautiful scenery on and about the Island would be merely a repetition of what I have before said, for it combines all the most charming and majestic features of this picturesque country.

I was interested in finding in the forests here, for the first time the splendid Rose-hay tree, but growing finer than I had seen it in New Jersey, though in dry soil. I collected during my stay a large number of plants, many birds, shells and other objects.

I was somewhat disappointed however in obtaining ~~specimens~~ ^{of plants} not before seen, and only observed two or three such. * I concluded that few of the insectivorous Warblers so common in the Atlantic States visited this part of the territory. In arthropods accepting I saw were scarce, many of the commonest species elsewhere being here entirely wanting, though the Island is only separated from the main land about half a mile. **

The last two weeks of March were as pleasant as the first had been disagreeable, there being actually no rain and though some frost at night the days were warm, and the season appeared as far advanced as May in New York. In the beginning of April there were one or two cold storms and as late as the 24th the lower wooded ranges of the Cascade mountains were white with snow for a few hours in the morning though none fell on the island.

Specimens not before obtained were *Talio columbiana*
Cervus macrotis - left behind for

* *Haematopus* ** Deer, beaver, weasels, raccoons, pine
- *Sylvicola coronata* and striped squirrels occur, white
Elk partridges, wild cats, skunks, hares, shrews and gophers
seem to be entirely wanting. Blue grouse are also absent
though the Duffered species was abundant.

A few ~~shrubby~~ plants are very limited in their range in these regions being more abundant elsewhere. Near Steilacoom I have observed ~~the~~ plant common East of the Cascades, but here only straggles. They are the "Poison vine" ⁽¹⁾ also found here and there along the Columbia and two others ⁽²⁾ —

On the marshy meadows near Cape Disappointment is found ^{rather uncommon} a species of Wax Myrtle ⁽³⁾ a fine evergreen. In sphagnum swamps there and elsewhere is a group of plants before referred to as interesting from their unusual association together in such places ⁽⁴⁾.

Just beyond them on the bare sand of the sea beach is found another group of plants entirely peculiar to the Western coast and only in this sand ⁽⁵⁾. There are also some found along the sea beach on both sides of the continent, and some even throughout the northern hemisphere which the botanist will readily recognize in the lists of species collected on the coast —

An interesting instance of the meeting of northern and southern species of the same genus is presented in the two kinds of Elder found in the territory — One the "Redberried" (*Sambucus pubens* Michx.) is confined to the cool shady forests where it is a common shrub ~~growing~~ growing twenty feet high. This plant extends across the Canadian Province and as far south as lat. 42° on the eastern coast. It also so nearly resembles the Elder of Europe, especially the western forms that Hooker unites them. The second species bears blue berries is a stouter more bushy ~~shrub~~ ^{shrub} about twelve feet high, and is entirely confined to the dry warm prairies, both sides of the Cascade Mountains and more abundant towards the south — This (*S. glauca* Nutt.) except in its larger size and the blue berries "can scarcely be distinguished from" the common species of the Atlantic States (*Torr & Gr.*)

One other series of shrubs remains to be mentioned which are confined to the inundated river banks, growing under the Cottonwood &c where they form dense thickets. Many of these extend over nearly all the United States, northward and through Canada —

- (1) *Rhus diversiloba* Torr & Gray (2) *Ceanothus velutinus* Dc.
Oreophila myrtifolia Nutt. (3) *Myrica Californica* ^{Chamisso} ?
(4) *Vaccinium macrocarpon* Ait. *Tiedium palustre* Trin.
Kalmia angustifolia Trin. *Nuphar advena* Ait. *Drosera rotundifolia* Trin. (5) *Abronia arenaria* A. *umbellata*?
Orobus littoralis Nutt. *Franseria* (2 species)

then the curious shrub *Nuttallia* (14), which in March has long
strings of white flowers followed in autumn by a black bitter
berry

(14) *N. cerasiformis*. Torr & Gray

Next above the Willows already mentioned, there is commonly a species of Cornel (1), which though of larger growth than in the Eastern States is generally considered only a variety. Its bright red branches form a pleasing contrast to the yellow of the shrubby Willows. Another species with green branches is more rare in similar situations.

On ground a little higher, but where it is often half submerged by the summer floods grows a Snowberry (2) forming the principal underbrush of the Poplar groves.

Higher yet are found the Salmon-berry, Crabapple, Hawthorn, and Fly Honey-suckle before mentioned, and with

these there is, also a large kind of Wild Rose (3) resembling that common in swamps of the Middle States but distinct.

Another species with very small leaves, and scentless flowers grows in drier portions on the border of Fir forests (4) and a third of which I collected fruit in 1853 is confined to the borders of the upper branches of the Columbia (5).

The Hardhack *Spiraea* (6) also often covers large patches of damp ground, on the borders of rivers, and prairies.

A remarkable scarcity of climbing shrubs strikes the attention of the botanist in this territory. I have met with but one west of the Cascade mountains, a Honey-suckle (7) which is not common anywhere, but most so near Puget's Sound.

East of the Cascades a Clematis (8) is abundant which much resembles the common eastern species. Several herbaceous vines are found however which much increase the density of the thickets.

One of the most remarkable is the "Giant-Root," (9) a vine somewhat resembling ^{the wild cucumber} ~~some~~ of the Atlantic states, climbing thirty feet high on river banks or on prairies forming bushy thickets about two feet high. Its root is often large enough to fill a flour-barrel.

Along the coast a Wild-pea (10) grows which spreads itself over bushes for many yards around, so as entirely to cover them; the Peas are used by the Indians as food. Another large species (11) grows in the dry fir forests and smaller ones in various localities (12).

On prairies also but in dry soil is found the Serviceberry (13) much larger in size and in its fruit than on the eastern coast. Its berry is one of those most used by the Indians.

(13) *Amelanchier Canadensis* Linn. var? *alnifolia* of Nutt.

(1) *Cornus sericea* Linn. var? (2) *Symphoricarpos racemosus* Michx.

(3) *Rosa fraxinifolia* Bork. (4) *R. gymnocarpa* Nutt?.

(5) *R. cinnamomea* Linn. (6) *S. Douglasii* Hooker. too near the

S. tomentosa. (7) *Lonicera ~~occidentalis~~ Hook. (ciliosa Poir?)*

(8) *C. ligusticifolia* Nutt. (9) *Megarrhiza Oregona* Torr. & Gray.

(10) *Vicia gigantea* Hooker. (11) *Lathyrus polyphyllus* Nutt.

(12) *L. patustris* Linn. *acervula* L. *venosus* Muell. *L. maritimus* Bigel.

then the
cane
the
leaves
strings
of white
flowers
in March
and black
buds in
April

4. *Nyssa
bifurcata*
Pursh & G.

April 24th I left the Cove on my return to Olympia, in order if possible to join Gen. Stevens party.

The sailboat was three days in the voyage, a distance of about 115 miles and we were much delayed by calms ~~about the "narrows"~~ ~~and the end of it~~. The weather being cloudy and rainy most of the time I made few observations and collected only a few plants at different points along shore.

May 1st I have been at Olympia five days, waiting for clear weather, which has been an almost constant succession of showers with about intervals of sunshine. Finding that the Governor would not be allowed an escort, and I would therefore have to go with him at my own expense; I concluded to accept Dr. Luckley's offer of a place at the Valley as surgeon, for six months during his absence. Meantime I wished to visit again the Plains near Steilacoom, to make collections particularly of land birds, and quadrupeds. I therefore started to day on a pedestrian excursion to that place, there being every prospect of fine weather.

The road for three miles led through forest of the usual trees and of large size. I then passed through a large prairie mostly cultivated, and bordered on its sandy soil by groves of the small Pine common on the coast but here larger. Then another forest, and a still larger prairie, more gravelly and abounding in oaks, which grow much like apple trees giving the appearance of a large orchard. Among them small parties of the beautiful little sea green swallow were sporting probably just arrived. I saw in the forest also the Red breasted wood pecker, and Canada-jay, both rather uncommon, and met with a flock of Blue grouse of which I shot one, besides some other birds as specimens.

Crossing this prairie about two miles wide I entered the wooded valley of the Nisqually River.

The descent is very steep and high, and the bottom apparently here three miles wide, covered with the usual trees, some of the Cedars being among the largest I ever saw. The river is evidently subject to heavy floods which have frequently changed its course cutting off many points of land.

I saw here the first of the Winter Tanager.

I have attempted a somewhat full description of these Forests, as they form so extensive and important a feature of the country, and as I believe no attempt has been before made to point out in a connected form their principal natural and Economical characters.

Of the animals inhabiting them besides the special notes relating to each species, I may remark that they seem to be comparatively scarce. The Elk is the largest which seems able to live in them, but both this and the Deer prefer the borders of prairies and are well known to be much more abundant in the Rocky Mountains and in California, where the country is more "open" — The Caribou or moose animals which dwell there are proportionately scarce, but the Black Bear, which feeds so much on berries is very common. Wild cats are also abundant, finding sufficient prey among the smaller animals. The one small species of Hare is not plentiful and frequents the borders of prairies. One Squirrel only is common, besides the little burrowing chipmunk — A large woodrat and some two or three small mice frequent the forests.

Raccoons so common Eastward are rather rare, but the Otter is numerous from the abundance of fish.

Foxes and Wolves are not very common but probably increase in the more settled portions.

Beaver are abundant and increasing, muskrats scarce. Of birds the Blue grouse is plentiful in the Valley Region but rare on the least, the Ruffed Grouse common everywhere — Scarcely any other birds are to be found in the depth of the forest, all preferring prairies, and river banks, among bushes.

The difficulty of hunting in such forests may easily be imagined and but few of the Indians are hunters. They have always found fishing a more easy and successful mode of obtaining provisions, and also laying up large stores of the numerous berries and of some roots.

Compared with the accounts of those who have travelled in the Rocky mountains, and with what I have myself seen during a short visit to California, I should call the country poor in large game, and much less full of animals of all kinds.

May 11th Crossing the river I walked on for four miles to the Misqually Farms, where I was hospitably received by Dr. Talbot, the director of this part of the Hudson Bay Company, who is well known among botanists for his collections of plants in this locality, during his residence of thirty years.

As soon as I ascended from the valley the prairie recommenced similar to those before passed through. Next day I walked about the vicinity and down to the shore of the Sound. There is generally, along the banks which are here a hundred feet high steep and generally, a belt of timber, though at one point the prairie comes down to the water. Behind this lies in an irregularly oval form the Misqually Plains comprising about thirty square miles between the Misqually and Puyallup Rivers. Their surface is smooth and level, but rising in successive terraces from ten to forty feet high as we approach the mountains, which generally run parallel for long distances. Every little marsh is a lake, small but beautifully clear and usually without a visible outlet. The deep gravelly soil absorbs the water during the dry season, though few of them dry up completely, and are neither stagnant or muddy. Besides the usual oaks there are around these and along the few small streams groves of Hawthorn, Aspen, Ash, Maple, and shrubbery.

On ~~rounded~~ hills which look something like islands in the plain are groves of the usual Fir, and these also occur in parts on the slopes of the terraces and isolated trees are beautifully grouped in all parts of the plain giving the whole the appearance of a vast Park laid out and ornamented by the skill of the highest landscape gardening. Directly East and in full view from all parts stands the majestic Mt. Rainier, so ~~imposed~~ ^{imposed} ~~there~~ ^{there} ~~as if~~ ^{as if} ~~but~~ ^{but} ~~five~~ ^{five} miles off though in reality, about 40.

The gravelly soil is excellent for travelling over and produces very good crops of grain, while in low spots are patches of the richest alluvium suitable for gardens. Though without the luxuriance of some other prairies this is well suited for farming.

On the upper part of the river between here and the 49th there are said to be extensive prairies similar to those near the coast.

Additional specimens obtained here were *Trichas Talbotii* *Vireo solitarius* *Spiza amoena* *Trichas borealis* *Sylvicola asotus* *officinalis*

The Prairies require a somewhat more special description than I have yet made of them. They may be divided into several classes all differing in their causes, soil, and vegetation, and confined to the Valley Region.

Near Vancouver, ~~but across enormous~~ ~~apparently the~~ ~~that~~ ~~prairies~~ are extensive meadows, apparently due to the summer inundations which have prevented trees from growing on them. They lie lower than the groves of Poplar etc. - which often cover the higher ridge between them and the river. The soil is very fertile but the floods have often been a serious injury to the crops, unless planted after the danger was past. Some on July 3. In some of the lower portions of these are permanent.

3. Lagoons and Sloughs containing stagnant water.

Such prairies are also found, less extensively on the Chehalis and other small rivers towards the north.

Those on the Willapa and the rivers flowing from the Coast Range, are not subject to summer inundations. The salt or "tide land" along the coast are another kind of low prairie, producing excellent grass, and as before remarked suitable for many other crops.

There is another kind of prairie, more extensive, and never overflowed. These are scattered along the rivers, and their branches up to a high part of the mountains, and also extend over considerable surface around the head of Puget Sound, and on the islands near its mouth. Their soil is generally inferior to that of the preceding, but generally productive and on those near the Coast, and the Straits of De Lucia very rich.

They are always bordered by dense forest of which the edge is as abrupt and well defined as if they had been cleared and fenced off for cultivation for hundreds of years. The chief reason of this, ^{abruptness} seems to me to be that the Indians have always burned off the grass, every summer. On some prairie near Biscanally and Vancouver where this burning has been stopped for twenty years young Spruces & Firs are found gradually encroaching on them, and Indians say that they remember when some of the ^{prairies} were much larger than now.

Dryas Ludovicianus *Aras Spinea* *Vireo gilvus*
Picus torquatus *Thalassidroma* *Fringilla socialis*
Parus verticillatus *Fringilla graminea* *Junco tyrannus*
Sturnus Bullockii

Emys marmorata *Varona Isabella* & several frogs & other reptiles which I left with Mr Gibbs in alcohol.

On the 14th I walked seven miles to Steilacoon where I remained the rest of the day preparing specimens and writing. Among the birds I shot on the way was by a happy coincidence the first I had met with of the pretty little ground warbler, named after Dr Soliman by Townsend. The day was fine clear and warm and the Sound reflected ~~the~~^{its} shores like a lake.

The next morning I walked four miles to Mr. Gile's farm where he had kindly invited me to visit him. I remained there six weeks, collecting with considerable success all that I could get hold of, going out myself ^{nearly} every day and in all directions (see p. 38¹/₂).

The Plains were then in their finest dress, the green varied in places by large patches of the yellow Ranunculus, the blue Camass and many other flowers, while the oaks and Poplars had become clothed in their new foliage.

There was a great deal of rain while I was there as if to compensate for the unusually dry winter. Clouds enveloped Mount Rainier constantly for two weeks so that I did not see more than its base.

A man who drove horses across the mountains reported that on June 1st the snow in Naches Pass was still twelve feet deep.

June was a very pleasant month throughout but with several showers, about enough for vegetation.

About the end of the month I was again disappointed by hearing that Dr. Suckley had been obliged to obtain another substitute, my letter accepting the place having been too long delayed by the irregularity of the mails. I therefore concluded to go again to Shoalwater Bay, in order to settle some important business before leaving for the Atlantic coast.

June 30th A.M. I left Steilacoon in a canoe and after 8½ hours hard paddling against the tide our two Indians landed me at Olympia.

The night was clear, the full moon shining beautifully, and as I did not sleep at all, my last sight of the Sound was a fine and pleasant one.

On the way we passed a large Park, going out, with every stitch of canvas spread to catch the light breeze and looking very beautiful. The night was only 6 hours long and daylight appeared at 3 A.M. long before we reached Olympia.

Noticed no birds except a few Black Guillemots. I met here P. 47 A. to B.

That these prairies were never entirely covered by forests is proved by the perfect level and smoothness of the surface. In a few places I have seen where the woods had been burned off, an approach to prairies - but there the ground is very uneven from the remains of roots etc - and bushes generally grow up in place of grass or herbaceous plants - It is therefore probable that the Indians in order to preserve these grounds for game, and for their important root the "Gamaf," soon found the advantage of burning them. The introduction of the Horse has been a further inducement for it, and seems to have made them resort much more to the prairies to reside, than before.

Occasionally a few ^{fire} trees may be seen beautifully grouped in the prairies. These are always of large size and their charred and thickened bark shows that they must have been larger where fires first began, to withstand it. The Oak and Blue Elder are the only other trees that are found around the dry prairies, and both stand the fires well.

Many of the richest prairies are much injured by being covered with a dense growth of Brake or Fern - which grows on them to the height of eight feet -

This though common on the poorer gravelly prairies, is there only a foot or two high, thus being a sure indication of the nature of the soil. It forms a good cover for Deer, and beavers build nests in it.

The vegetation of all these Prairies is too varied for description. It differs so entirely from that of the Forests that I believe very few plants grow in both.

While those of the Forests are generally of a northern clasp and many extend across the continent, the plants of the Prairies are mostly peculiar to the Western Portions, and of a more Southern group.

The Gamaf is perhaps the most important, being a very good esculent root. It is abundant on almost all prairies but largest in damp rich soil, where it is sometimes two inches in diameter. When cooked it somewhat resembles the sweet potato in flavor.

Its bright blue flowers almost color the surface in May and June when the Indians dig the root.

(1) *Gamassia esculenta*

This remark applies to the trees such as the Oak, Elder, and Mountain as well as the herbaceous plants.

Having packed two large boxes of specimens and shipped them for San Francisco, to meet me there, I started from Olympia July 3^d and rode in a wagon to Grand Mound Prairie, where I stopped for the night at the Hotel. These prairies are more sandy and apparently better than at Pasqually, and the same plants grow much larger on many of them.

July 4th Being in too much of a hurry to stop and celebrate the day with the city and of the vicinity, I started at 7 A.M. on my way to the sawmill of the Armstrong on the Chehalis where I hoped to find a canoe to take me down the river. But mistaking the trail, I went about five miles out of my way along Black River and made the mile about 25 instead of 15 miles, but arrived at the mill just before dark.

The morning was overcast, but it was clear and warm after 9 A.M., with a refreshing westerly breeze.

The gravelly plain continued nearly all the way, with an interval of rich, but marshy meadow along the banks of Black River. (Insert P. 23 A. to bottom) *

(Mounds from P. 41) Having travelled for some miles on the prairies of Black River, I found that I must be on the wrong trail and making inquiry from a farm house was directed by a shortcut on my course. I soon struck Black River again, and after crossing it three times, the last very near its mouth, reached the Chehalis, and continued along this to the mill. The prairie improves fast after reaching here and are entirely free of the Mounds. On those near here I saw a few Oaks the last met with and appearing sickly covered with moss and stunted, and near them saw the first Black spruce.

July 5th I had to wait all yesterday and today for a conveyance, but started at 5 $\frac{1}{2}$ P.M. from the fine prairie opposite the mill in a canoe with a surveyor and a crew of three Indians. After going about ten miles we camped, not liking to run the rapids in the dark. The river was now very low and strikingly different in appearance from that when we travelled up at last March.

* It appears to me that the Chehalis must once have run the present course of Black River emptying into the Sound, and I have even thought that the Leon Umbria may have at some remote geological period, before it broke through the Coast Range run this way, and perhaps had something to do with the Mounds.

I have already alluded to the "Giant Root," which is common on many of these prairies, but I must beg to differ from the able Geologist of our Survey, Mr. ~~Gibbs~~ as to its power to cause the mounds, which are so remarkable a feature of the prairies near Puget Sound.

It is certainly often found growing on them but is as often in the hollows or on level ground, where its root does not seem to be able to produce any such effect.

Mr. Gibbs I believe never saw the mounds along Black River, where, over an extensive surface, they rise higher than a man's head, their bases standing so close together that it is difficult to walk between them without stepping on the opposite slopes. Nothing capable of causing them in any way grows near, and the woods adjoining are destitute of ~~them~~.

On this much discussed subject, I would hazard the conjecture that they were caused by eddies and Whirling Currents in the water, at a time when all these prairies formed part of the bottom of a Sound or Estuary. I have seen such currents in Puget Sound apparently capable of thus raising mounds of gravel and sand, just as the wind does with the lighter sand of the seabeach and the Central Plains.

The mounds on the mountain slopes near the Dalles may have had a different origin.

These prairies are very important as nuclei for the settlement of the territory, being scattered everywhere throughout the forests and always near water. They are however often disconnected by extensive tracts of forest, and new ones are being continually discovered. Many of the best on the Chehalis and near the Sound are still entirely unsettled.

They appear from February till July like gardens so great is the variety and brilliancy of the flowers covering them. To a traveller triling through the Forests on foot, it is like a Paradise to reach one of them, even though no sign of the welcome cabin of the Pioneer has yet appeared on their virgin soil. He often finds game, and always some life to relieve the gloomy silence of the woods.

+ See his "Reconnaissance" of Dec. 1st 1854

These mounds are too uniform in size and too symmetrical to have been caused by the stumps of fallen trees, ^{or by the reaching away of the roots and bushes etc.} They are always from six to eight feet in breadth at the base, perfectly circular, and vary in height on different prairies from a scarcely perceptible swell, to eight feet. Very rarely do two or more appear united at the base but they follow an almost perfect quincuncial arrangement.

4 1/2 Having slept well though rolled up only in a single blanket, on the hard gravelly shore, before the fire we
Only 7th Started at 3.40' A.M. with the daylight and descended to within ten miles of the mouth of Gray's Harbor, reaching my Indian ^{camp} ~~camp~~ at 1 P.M. Having left the surgeon ashore about noon I was here alone, for the first time among a tribe of Indians. As I had had opportunities of giving medicine to some of them formerly they were particularly hospitable, and treated me with the best of their fare, consisting of excellent Salmon berries which they were then busy collecting, Dried salmon, and sturgeon & Steamed Kamaf Roots, luxuries not to be despised by the hungry traveller. We had got a heaver on the way down, but though I much pleased to get a fine specimen I did not at all relish the meat, which they seemed to find delicious.

I slept at this camp, and next morning was taken to the mouth of the ~~Harbor~~ which I reached at 10 A.M. I immediately started on my long walk for Shoal water Bay, which I reached about sunset, without incident of importance more than I have before met with on this sea-beach, just P. 4 1/2 to A.

The day was quite cool, the wind S.W. and of course in my face, the temperature and appearance being precisely the same as in my walk up in ~~the~~ ^{the} ~~bay~~ ^{bay}. I saw no ^{sea birds} ~~seabirds~~, but some ^{Pelicans} ~~dead~~ ^{Albatrosses} killed in some recent storm and the usual shells crabs, & giant Sea urchins. I was surprised to find abundance of the beach Strawberry size, those of the prairie having been ripe when I was at the Sound in May, two months earlier.

Thus they occur in the territory from May to August, on the 4th of which month we had them on top of the Cascade Mts. in 1853.

I observed in the Bay that several species of water birds had already arrived from their northern breeding places, among which were, Gadwits, Pelicans, Gulls, Sheldrakes, Plover, sandpipers and Teal.

* *Fragaria Chilensis* Ehrh. *Arvicola leucogaster* —
Specimens in July & Sept not before obtained were a
Tringa Wilsoni *Carduelis tristis* — *Ardea Herodias*
Pelecanus fusces, *Phalacrocorax Townsendi* *resplendens*.

Some general remarks upon the Waters of the Territory and their inhabitants as necessary to complete the description of the country. The Rivers naturally come first being most intimately connected with the form of the surface —

I have already alluded to the rarity of swamps, the complete drainage, the velocity and clearness of the streams which are the effects of the mountainous character of the country. The great quantity of rain at certain seasons, requires a great number of streams to carry it off, and an inspection of the map will show that though generally small they are remarkably numerous, and comparatively much more so west of the Cascade Range —

Flowing commonly from regions of perpetual snow, they are also very cold, and the sun heats the water only where expanded and shallow — East of the mountains, the marked difference between the Okanogan and the Columbia was mentioned, as well as the occurrence there of many species of Mollusca, and a water plant not found in other branches. On their west side I have also mentioned the swampy character of the Black River. It will be observed that these two flow in directions parallel to the mountain ranges and not across them. I may observe also that the Willamette having the same parallel course and also coming from the South is considerably warmer even at Portland than the Columbia, so that in June I found it pleasant to bathe ^{there} while at Vancouver the water was entirely too cold; the flood being ^{then} at its height. The Willamette is also much retarded and "backed" by the floods of the Columbia, ~~and~~ ^{besides} ~~it~~ ^{thereby} ~~its~~ ^{raising} its own rise at the same time —

The only Record of the temperature of the Columbia I have access to is that kept by Mr S. D. Ciles, assistant Meteorologist of our party, during the freshet of 1854. By this it appears that at the commencement of the freshet on May 8th the temperature was only 40°. From this it rose and fell alternately until July 20th the highest being 53° on June 30th. From July 1st to the 20th it gradually rose from 47° to 53.5° and probably continued to rise as the freshet subsided —

I hoped to have been able to visit the summit of the Cascade mountains again before leaving the territory, but I found unavoidable detentions at the Bay, and was obliged to give up the project. I remained about the coast for three months longer thus making my observations ^{at that part of the territory} complete for a year, having resided there nine months before, and now compensating for my ^{six weeks} absence last summer.

In order to vary my field as much as possible I resided most of this time at the south end of the bay on the "Peninsula," and made also several excursions to the Columbia and round by sea outside.

I was struck by the evidently finer growth of the crops this summer, it being much drier and warmer than the last, while there were at the same time complaints of drought in the interior valleys.

I remained on the Peninsula until July 17th and made several excursions both on land and water but obtained few specimens, though I saw some things not before seen here as mentioned in my notes.

July 17th Crossed the Peninsula to the Ocean beach and walked along it to Baker's Bay, a distance of twenty miles, ^{stopping at the mansion of my old friend Mr. Holman.} All day a dense ~~cloud~~ sea fog enveloped the shore so that I could not see far ahead. Saw another dead Murret and a few of the Western Gull. Several flocks of shorebirds including the Turnstone, Swiss and King Plover, with the Green-winged and Alpine Sandpipers were feeding on the edge of the beach. Reaching the Cape at sunset and low tide, I walked as far as I could get over the rocks at its foot, hoping to meet with some of the birds found in such places, and perhaps to see a Seagull. I saw nothing living about the place.

18th was very pretty, the hottest day I had ever seen on the coast, though a fresh N.W. breeze blew, it is entirely shut off from Baker's Bay by the Cape.

19th Cool and pleasant. Went to the Cape and walked again around its northwest side but saw none of the birds I was in search of. Observed several flocks of Pelicans and Gulls all flying northward. A few ducks and a loon were about the Cape. The small codfish are now abundant & washing ashore in great numbers supplying food to the Eagles, Ravens, Beavers, and Gulls.

Some Salmon and many Sturgeon are now caught by the Indians.

The period between August 1st and December, being that of the lowest stage of water is probably the warmest. Records were kept of the temperature during this time by several of the exploring parties, but I have not seen them. A few scattered observations however show that even then the water was cold. Lieut. Mowry mentions that at Fort Okonagawa, near the lowest part of the Great Columbia basin it was on Sept. 2nd 1853 "above 52°" Lieut. Saxton on August 16th found it in "many little streams of pure cold water emptying into Black's Fork" only 40°. It is probable that in the warmest parts the Columbia rarely rises above 60°.

I am inclined to attribute to this coldness and to the little organic matter contained in its deposits, the small variety of animal life compared with that of the rivers of the eastern side of the Continent. In the clear cold streams I never found but one species of that numerous family the Naiadae (fresh water pupae) so abundant in all the Eastern rivers. This one seems to be also identical with a shell found entirely across the Canadian Province and also in Northern Europe though on this there is a difference of opinion (1).

With it in all the streams I have seen I found a few small univalves only (2). But in the lakes of the Okonagawa, Black River and the lagoons near Vancouver, several more species are found abundantly, which are further described in my special notes and lists.

The fresh water fish also seem to be of but few species though abundant in individuals, being comprised mostly of the Trout, and Carp, or "Suckee," families. The Salmon, Sturgeon, Lamprey, etc. which go up the rivers to spawn, belong more properly to the Marine group.

Reptiles I have very rarely seen in the rivers, all being found in the warmer ponds and lakes.

One Crustacean has been referred to as the animal most universally diffused, as there is hardly a stream from the coast to the mountain summits without the "Craiofish".

(1) *Margaritana margaritifera* (Linn.), (2) *Melania plicifera* Linn. *Paludina Nuttallii* and others.

July 20th Morning cool and foggy with a S. wind
 Walked to the top of the Cape and while sitting
 there saw one of the ~~rose~~ Cormorants I was in search
 of, fly from the rocks, which were hid from my view
 by the projection of the cliff, and alight in the water
 where it remained diving for fish for some time.

I at once descended and in a little broken skiff, went
 with the — the light house-keeper and his assistant
 around to the outside. We had scarcely passed the
 sharp corner dividing the smooth waters of the river
 from the surf outside before a flock of about two-
 hundred flew off of a rock, which was perfectly white
 with their dung and circling round us went off to
 a distance. From the rough tops of the boat I
 could not take aim and made only one shot at them.

I saw on the rocks also a single bird which I
 supposed to be Townsend's Surf-bird.*

The next morning I again went round the Cape
 and landing on a rock, before they saw us I suc-
 ceeded in crawling near enough to shoot one, which
 fell in the water etc. ~~this one was~~ immature and
 in imperfect plumage I did not again venture
 in so hazardous a mode of getting them —

The caverns under the Cape marked by the sea
 are inhabited only by the Barn-swallow, whose
 nests I saw sticking near the roofs — Another
 which is low and extends back about 80 feet, I
 had visited when I first came here but found no
 animals. I saw however a large pile of sticks and
 some bones which I then thought might have been
 brought in by some bird for a nest, but I now think
 it was the work of the Woodrat, whose curious
 habits I have elsewhere mentioned —

Otters are abundant about this cape but very dif-
 ficult to find as they have a safe retreat in the
 dense thickets which cover it besides the cavern
 and the water.

Sept P. 42 to 45 A.

* *Aphriza townsendii* — *Phalaropus townsendii* Aud.

The Columbia continues very fresh to its ~~very~~ mouth and I have found it drinkable at high water in ~~August~~ ^{July}, at the inner side of Cape Disappointment not more than a mile from the breakers outside. There are consequently but few of those animals frequenting Estuaries found in it. Though I have been there at all seasons I could find only ~~two~~ marine shells on the shore (1) though in Shadwater Bay just north of it there are more than twenty. (Several others have however been obtained by dredging at the mouth of the Columbia by the U.S. Expl. Exped.)

Among the rocks outside of the Cape, several species of *Patella*, ^{with} *Balanus*, and *Crustacea* are found. *Agostus* live very soon anywhere within the Columbia, and the extensive sand flats outside of its mouth are unfavorable to the growth of almost any Mollusca —

Fish are abundant here though I have seen but few species. Besides the Salmon, Sturgeon, and Lamprey, which as already mentioned go far up the river, there are small cod fish abundant at the mouth in August when they appear to follow in a smaller fish, and become so gorged, or perhaps affected by the fresh water that cartloads of them are thrown ashore. A larger kind is caught with the hook on the bar. I have fished in vain near the Cape for any other kind, though I believe at certain seasons other fish are common in the river.

(A.) The Ocean off the Columbia partakes of its poverty in some respects. Though I have several times walked along the whole of that low sandy ^{beach} ~~point~~ extending from Cape Disappointment to Gray's Harbor I have found little to reward the collector. One Mollusc only (2) seems to inhabit the sand at low water mark.

All the other shells I found had been washed out of the bays in the vicinity. In June great numbers of a large Crab are washed up, apparently in the attempt to get into the bays where they also abound there.

Almost every year small Whales are stranded on this beach and supply a rare feast for the Indians, but I have never had the opportunity of examining one.

Whalers say that they are of the kinds called "Finback" and "Humpback" which abound off this coast —

(1) *Mytilus edulis* Linn. (*Sanguinolaria*) *Macoma inconspicua* Dr. Wh.

(2) *Machaca* (*maxima* Gould) *patula* Dixon

A round flat "Sea-egg" (*Spatangus*?) is one of the commonest objects on this beach, but always dead and bleached.

July 23^d I crossed the river to Astoria, principally for letters which I expected to find there.

The day was cool and cloudy and at night it rained lightly for the first time since July 5th.

I then saw for the first time the curious "Level" of Lacer & Clark, which no one has since been able to get specimens of. This one had been found drowned in a tannery vat, and was preserved by Lieut. Townbridge's dental observer Mrs. Wayne.

July 24th I left Astoria in the Schooner *Elaine* bound for Shoalwater Bay, as I was desirous of making a trip outside to see what peculiar animals were found off the river at this season.

The fog being thick we got aground and had to stay there for ^{six} eight hours when the returning tide floated us off, and we crossed the river anchoring for the night at Chinook Point.

Fortunately for us it did not storm while we were on the sands in the middle of the river.

The next morning at 9½ A.M. we weighed anchor and beat down with the tide, a fresh west wind assisting us. About noon passed the Cape, and sailed out to sea slowly. The sea was very smooth the swell though high not breaking over.

As the moon almost entirely failed on the day as it commonly does when light we got out only by the aid of the strong ebb tide.

Outside a strong S.W. current set us off shore rapidly and we made little progress northward.

Low in the river current outside several of the Cormorants of both species, also a few ducks & a small brown bird which I thought might be Townsend's Gull. A few brown Albatrosses ⁽²⁾ were flying about.

July 25th we beat all day slowly against a head wind, and current, and about dark were off the mouth of the Bay, but it was too late to venture in as the night was cloudy.

Saw no birds except what I noticed yesterday and few of those, except Pelicans, large flocks of which were about the Bay.

Uria Townsendii Aud.

Piomedea brachyura Linn young.

In the summer of 1855 a "Killer" came ashore near the Cape, part of which was seen by Lieut. Trowbridge. Such, with large masses of the "Giant Scaevola" of this coast, ⁽¹⁾ and occasionally a dead *Eklatrops* or Gull, are the only specimens to be picked up on this beach. Great quantities of drift logs cover the higher parts, and with the drifting sand serve to increase the height of the shore until some severe storm, or change in the Ocean currents carries them all off to another place.

The long Peninsula forming the outer shores of Shoalwater Bay has evidently been entirely formed by the deposits from the outer currents of the Columbia, ~~which~~ ^{which} they also extend for twenty miles or more north of Gray's Harbor, the beach being throughout sandy.

Above that point I have never been, but it is said to become more and more rocky, with many small rocky islands towards Cape Flattery, which serve as breeding places for immense numbers of sea birds and are the favorite resorts of the Seawater.

A. Shoalwater Bay is much richer in animal production than the adjoining waters. As it has been but recently laid down on the maps some account of its size &c seems necessary in connection with its natural history. It is twenty five miles long and from three to seven in width ~~there~~ covering over one hundred square miles of area. Of this great surface two thirds may be said to become bare at ordinary low water and four fifths at the lowest tides, which occurs twice a month or about twenty four times a year, being lowest in May and June.

Between these least and greatest falls there is every stage of low tide from only six inches below high water to thirteen feet. These changes taking place as elsewhere about forty minutes later every day, and a great and slight fall alternating in each twenty four hours.

This is I believe the nature of the tides on all the Western Coast and, has important influence upon the animals inhabiting the waters. The mean depth of water on the bar of this bay is $3\frac{1}{4}$ fathoms which increases a short distance inside to 17 fms. and in the channel varies from this to ~~three~~ fms. at the mouth of the river.

Macrocytis.

July 24th At daylight found our anchors drifted some ~~more than~~ six miles off, but the breeze being fresh entered the bay and came to anchor at 12 M. inside Deep Shoal water. I crossed at once to the other side of the bay - where I remained two weeks, expecting every day the arrival of the ~~Surveying Steamer~~ ~~Itasca~~ waiting for long expected letters - I obtained but few specimens during that time, though I used every means, and hunted as much as I could -

* ~~Aug 15th~~ ^{Aug 15th} I was called for to see a head case at the south end of the Bay twenty miles distant -

Starting after dark I went with the tide to the settlement on the Peninsula which I reached at 2 A.M. Next morning I got a horse and rode up along the Bay-side of the peninsula about fifteen miles. This shore is hard sand for about eight miles when it becomes mud, and the trail has to take a course through the low grassy meadows, crossing two creeks which run from the ~~marshy~~ marshes and lakes in the middle.

Higher sandy ridges run parallel to the water covered by dense spruce forest and some Fir trees.

The beach side is higher and mostly sandy prairie with groves of the small Pine -

Fine meadows occur at intervals on the Bay side, producing as elsewhere excellent grass and clover - and affording the best of pasture where the prairies inland are dried up -

The day was warm, and clear, and I saw scarcely any birds and no other animals -

19th My patient being out of danger I sailed down the Bay again - Saw only a few Duck and Gulls. The next day I sailed ^{3 miles} up the Bay to the Pt.

The next in size to the Willopat, and which I had not before visited. There is but little man snow along this river as high hills come down close to it on each side. On its upper parts there are said to be prairies but no white man has yet visited them -

On the night of the 24th there was a fine shower the first since July 23^d more than a month -

There are five Rivers emptying into the Bay which bring down a large amount of fresh water, and six large creeks mostly caused by the tides flowing through meadows — The Willapa, the largest river is navigable for about fifteen miles, which is the head of tide water and the others from four to twelve miles. There is thus a large amount of fresh water mixed with the salt in the bay while the rivers are all saltier at their mouth than the Columbia and for a longer distance up them —

The bottom of the bay is composed of sand near its mouth which becomes more and more mixed with mud towards the mouth of the rivers, until towards its southern end it is too soft to bear a man's weight at all, as it is in the rivers nearly to the head of tide water —

There are a few hard sandy and gravelly points about the bay and near the southern end some isolated rocks, which I have never examined — At Stony point is a row of loose masses of Basalt resembling boulders —

Such a variety of "Stations" produces a corresponding variety of Mollusca, of which I have noted all I could find — In the brackish water of the rivers are only the two found in the Columbia. In the bay nearest their mouths in soft mud are successively found two species of *Tellina*, ^{two of} *Venus*, the great *Enclavia*, the *Oyster* and *Cardium*, the last being in the hardest sand — *Patella* and *Littorina* are found on the rocks and a *Purpura* and *Chiton* below low water and on oyster beds —

It is remarkable that such a large variety, and so large species are found along the Eastern coast nowhere north of Cape Hatteras. A very similar series inhabit the coast of Florida many of the species being analogous.

The great numbers of Waterfowl which frequent this bay in fall and spring has been fully stated in my notes on specimens. It is however to be remarked that most of them are identical with Eastern species, the few that are not, being either birds that do not migrate very far north, or, stragglers from the Asiatic coast —

The fish I have more fully described elsewhere also — Their variety is much greater than I found in the Columbia, though the additional species are mostly small —

A single very large Starfish is found in the deep water also, being the only Radiate animal I have seen there —

Done

Sept. 1st The birds before mentioned are becoming quite numerous and some flocks of Geese have passed over towards the southeast.

(I have obtained lately some specimens of moles and shrews, meadow mice, and ground squirrels, none of which are new, ^{to the} ~~by me~~ though not often obtained.

* Today got a specimen of the rare emu, which I found solitary as usual, and which is a young bird differing from those before shot in spring plumage.

On the 3^d I went again to the Peninsula and spent two weeks there exploring but collected only two new specimens. I watched several evenings with out success for deer and hunted elk, through the forest. Both animals are common but very difficult to find in the dense thickets, though sometimes shot from ambush. ~~Methods~~ ^{Means} for hunting them are not yet introduced.

The weather continued delightful until the 15th when it rained, clearing off again next day.

The U. S. Steamer Active Capt. Alden, arrived ~~in the bay~~ on the 13th to complete the survey of the Bay, and on board were my friend Lieut. Townbridge U. S. A. and Capt. Russell who had piloted her in. I went on board, and afterwards accompanied the officers in several of their exploring parties.

Sept. 2nd The two gentlemen above mentioned and myself went in one of the boats about three miles up a creek, the "Macho", camping near its head at sunset. We hoped here to find game of some kind but did not see any, but Gulls, Sheldrakes, Herons, and Teal. In the morning we descended to its mouth and shot a few of the above mentioned birds. I here saw for the only time in the territory a Rail-bird, but could not get it.

* *Chicola asigna* ^{Sealops} ~~formosa~~ ^{Californ.} ?

(K) *Totanus oceanicus* 3

Gray's Harbor has apparently much less variety of marine animals than Shoalwater Bay. The oyster is not found there, though the Cardium and probably others of the same species are. The harbor is throughout sandy and muddy, but the water is probably saltier than in the Bay, ~~there prevailing~~ ^{the greater of the ~~oyster~~}. In two visits to that place and an ascent and descent of the Chehalis I failed to find any other species and all are rare.

In the fresh water of the river the usual Melania and Pearl-mussel are found, the latter being wanting in the rivers of Shoalwater Bay that I have explored.

In my short visit ^{to} and voyage down the Northwest Sound I had little opportunity for collecting its animals, and I believe obtained none new. I can however bear witness to its richness in that respect, which is much greater than that of Shoalwater Bay.

In addition to the Stations found in the Bay there is a great body of water from twenty to sixty fathoms deep and almost as salt as the Ocean itself, while, it is protected from storms by a high range of mountains on each side. Its great depth and the renewal of the water three daily by the tides which vary several feet more than those of Shoalwater Bay, keep it at a very even temperature, and fit it to be a great nursery of marine productions. All the species found in Shoalwater Bay occur there, ~~and~~ and many others.

The Oyster however being very small in the Sound gives the Bay a great advantage as it has created a considerable commerce between that port and San Francisco and besides attention to the other resources, it possesses for agriculture and the lumber business.

One thing has often been remarked of this country, that though the land was comparatively wanting in game, ~~the waters~~ ^{they} would always produce an abundant and inexhaustible supply of food of excellent quality. This has made the Indians essentially a fishing race and seems to have effected great natural distinctions between them and the Hunting tribes east of the Rocky Mountains. These questions however belong to the science of Ethnology, more properly than to that of Zoology.

* In March 1855 when the river was very high from heavy rains I found it taste brackish nearly twenty miles from its mouth.

The last ten days of September were rainy and foggy most of the time and though I hunted industriously I obtained few specimens and saw nothing new - I was now fully satisfied that nothing worth staying here longer for, was to be got, and wishing to return to the Atlantic in time to prepare my report, as completely as possible, I was glad to accept Capt. Alden's offer of a passage to San Francisco.

I had besides spent a great deal of money in my various explorations and seeing no prospect of any situation offering by which I would have an opportunity of visiting and collecting in the East side of the mountains, as I would have liked, I felt unwilling to devote more time & money to a field now producing so scanty returns.

Having therefore packed up my animals, and plants collected since I left Olympia, I went on board the steamer the morning she left the Bay.

Oct. 4th. Today about 3 P.M. the Steamer started seaward, and I took a last look at the Bay which had been to me the scene of many an adventure and pleasant time for more than a year.

The day was clear and delightful and though I had begun to be tired of the monotony of life there I must say that I felt somewhat sad, at leaving a place, where I had spent so many days with ^{pleasure} ~~interest~~ in my favorite pursuits, and where I had become interested by the growing prosperity and by that feeling of independent enterprise inspired by a frontier life, the generous hospitality of the citizens where I had been, and the friendly ^{assurances} ~~assurances~~ always met with among our hardy pioneers, had caused me to look upon the Bay almost as a home, and I take this opportunity of expressing my thanks to the citizens of the territory for their important assistance, which was so universally given, that it would be unjust in me to mention any particularly.

And though compared to the labors of naturalists in the richer fields of the south, my Report may appear of little consequence, I hope this Journal may at least show that I improved all opportunities, and made the most of my means for collecting while in the territory.

The Scenery of the Forest Regions, as might be supposed from the description of them, is often exceedingly grand and majestic. To one accustomed to that of the Atlantic States, every thing appears to be planned on a superior scale, twice as great as there, and the influence of this on the human mind appears in the increased, energy and enterprise so conspicuous in the citizens of the Pacific coast. The Columbia scarcely surpassed in magnitude by even the "Father of Waters," is bordered by cliffs and mountains, clothed by an immense ^{con} Forest growth. Above which towers in undecipherable majesty the peaks of the Cascade Range covered by perpetual snow, which shines in the sun in brilliant contrast to the dark green around their bases and the deep blue sky above them.

And to relieve the coldness of the prospect, a light mist often envelopes them and is tinted by the setting sun with the softest hues, ~~which~~ gradually changing through all the shades of rose, purple, and blue, until in moonlight nights they appear like silver monuments.

And there is no less beautiful scenery of a milder kind. The smooth prairies, dotted with oaks which at a distance look very much like apple-trees remind one so strongly of the most beautiful rural scenes of the middle States that it is hard to get over the illusion that he is in a land which has been cultivated for hundreds of years, and with the object of making it as beautiful as an ~~am~~ ^{appearance}. Nothing seems wanting in many of the wildcat tracts, except the presence of civilized man, and it must be acknowledged that he often more than improves the lovely face of Nature.

Along the Northwest Sounds, these varied forms of Mountain, woods and prairies, are combined with the calm blue waters, lying like a lake ~~deep~~ in the Basin formed by their almost perpendicular cliffs, ~~and~~ with their ever changing outline of bays and points, and dotted with Islands of every size and form.

Nor is the Coast wanting in all the grandeur and beauty which characterizes the Pacific Ocean, whether its waves break in surf upon the sandy beach or dash in wild tumult upon lofty precipices. The same loud roar night and day speaks in awful tones of the Great deep, and of him whose "Path is in the great waters and whose Footsteps are not known".

Our voyage down the coast of sixty eight hours, was delightful, and strongly contrasted with the unpleasant weather we had in coming up the same 1853. Though generally too far off to see much I noticed that the dense forests of Oregon began to disappear towards the boundary of California —

At Cape Mendocino which we passed within about two miles on the 8th they have become less extensive than the prairie and are confined principally to the northern slopes as I had observed in the interior of W. T. The appearance of this cape was very beautiful, the mountains rising at least 3000 feet above the sea, and varied by groves in the most pleasing manner. The sea was so calm as scarcely to break against the immense rocks and cliffs at its foot, where hundreds of large seals, Gulls, Bransons etc were basking in the sun.

From there southward the characteristic brown hills of California were constantly seen.

I saw no sea birds except those before mentioned until near San Francisco Bay where the Murre is common, as well as other species peculiar to the southern part of the coast —

Large numbers of whales, said to be the "Hump back" & "Fin back" kinds were sporting off there and we had seen some ever since we left the Columbia River —

Oct. 7th At 2 P. M. we anchored off San Francisco, that great city, grown up almost with the magic of Aladdin, and which had more than doubled in size since my arrival three years before. I took leave of my kind entertainers much indebted for their courteous treatment.

Wishing to see a little of California I remained two months, most of the time in Santa Clara valley, where I was much and deeply interested in the numerous variety of animal life compared with what I had before met with. I can only mention here that I collected in that time five species of Mammalia and twenty one of birds besides observing about 40 others, and several quadrupeds besides.

On the 5th Decr I left in the Mail steamer and arrived safely at New York. But stopping at Panama two weeks to collect shells I was so fortunate as to catch the fever though I got over 200 species of shells in

In concluding these few observations on one of the most interesting portions of our country I must express my thanks to those who ^{have} assisted me in my favorite pursuits —

First to the officers and gentlemen of the Expedition I am indebted for much aid in collecting specimens and observations, and especially to Mr. Gibbo the able geologist and Ethnologist of the Western Division, whose extensive acquaintance with the country, ^{made} during a long residence there, and accurate observations on its Natural History have been of great assistance to me.

From the citizens of the territory generally I have always experienced the ~~frank~~ hospitality so characteristic of our border Pioneers, and have often obtained from them important information.

The gentlemen of the Hudsons Bay Company have also extended to me all that hospitality which that rich and powerful association always shows to ~~those who in the~~ ~~prompts of science have wandered to their isolated sta-~~ ~~tions, far in a desert of strangers.~~

From this distant State after months of absence I look back, ^{with pleasure} upon the years spent in Washington Territory, as among the happiest of my life. The freedom of a frontier life, the delightful climate and scenery, the novelty and interest of its natural productions, combine to make a feeling, ^{inexpressible and} unknown in the old settled States, and which those who once experience can never entirely overcome.

But while this affects all deeply, it is doubly strong with the naturalist, to whom everything has interest, in a new country, scarcely to be equalled by the deeper but more abstract studies he must resort to in a country ^{so} long since superficially explored, as that of the Atlantic States. But even here the rich mines of Science are scarcely uncovered. The developments continually making ~~in our~~ ~~discovery~~ show that though the "surface gold" ^{is} ~~is~~ ^{being} ~~is~~ extracted in the United States, places of mechanical wealth wait only for the hand of enterprise assisted by the Capital of Science, and the mother power of the liberal State and General Government.

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An examination of the accompanying lists of plants collected on the two sides of the Cascade Mountains, will show still farther the great difference in the vegetation. Those also collected East and West of the Coast Ranges differ very much, though in a less degree. Still I have no hesitation in saying that there is very nearly as much difference in the successive Floras of these regions, as seen in going across the two ranges from west to east, as there is to be found in a line of travel commencing on the Atlantic coast in New Jersey, crossing the Alleghand, the Ohio and Mississippi, to the ~~base~~ ^{summits} of the Rocky mountains.

~~The animals also show much of the regional limitations of species peculiar to the whole western coast. But being fewer in number and less distinct from the species of the Atlantic side, they cannot be so easily divided into distinct sections, according to their geographical distribution. I have however made an approximate comparison of the Birds with those of the regions east of the Mississippi. Of 138 species known to inhabit the territory, ^{by appearance only in N.Y.} ~~are not found in that region except as stragglers.~~ 58 are constant residents, while in New England and New York there are only about 42, 72 are summer visitors only, and ~~merely~~ pass through in their migrations in spring and fall. The water birds are as nearly identical in species on both sides, as to be but little different in distribution.~~

Wash Ter.

New York

Identical species 114

Land birds 88

Resident 29
southern 29

Northern 10
migratory 39

Resident 5

South 15

North 25
45

Water birds 48
114

Resident 23
Southern 35

Northern 10
migratory 48

Resident 5

South 15

North 25
48

Different species

309

114

195 Land 104

Water 85

Land 58
Water 12

Resident 25

Resident 12

W.T. Identical species 114 N.Y.

Resident 34 Migratory 88 Resident 28 Mig. 88

Migratory Different species

W.T. 25 45
59 125
184

" 12 188
40 182 287
309

W.T.

N.Y.

Summer Resid. Winter Summer Resid. Winter
species common to both sides of Continent

Land 29 29 10 Land 35 23 10

15 species for each 26 Water 15 15 N. 26

Birds common to both sides of Continent 114

1st Resident in W.T. 29 Land 5 Water Total 34 sp.

2nd Summer " " 29 " 15 " " 44 "

3rd Winter " " 10 " 26 " " 36 "

1st " " N.Y. 28 " 5 " " 28

2nd " " 35 " 15 " " 50 "

3rd " " 10 " 26 " " 36 "

Total 114